

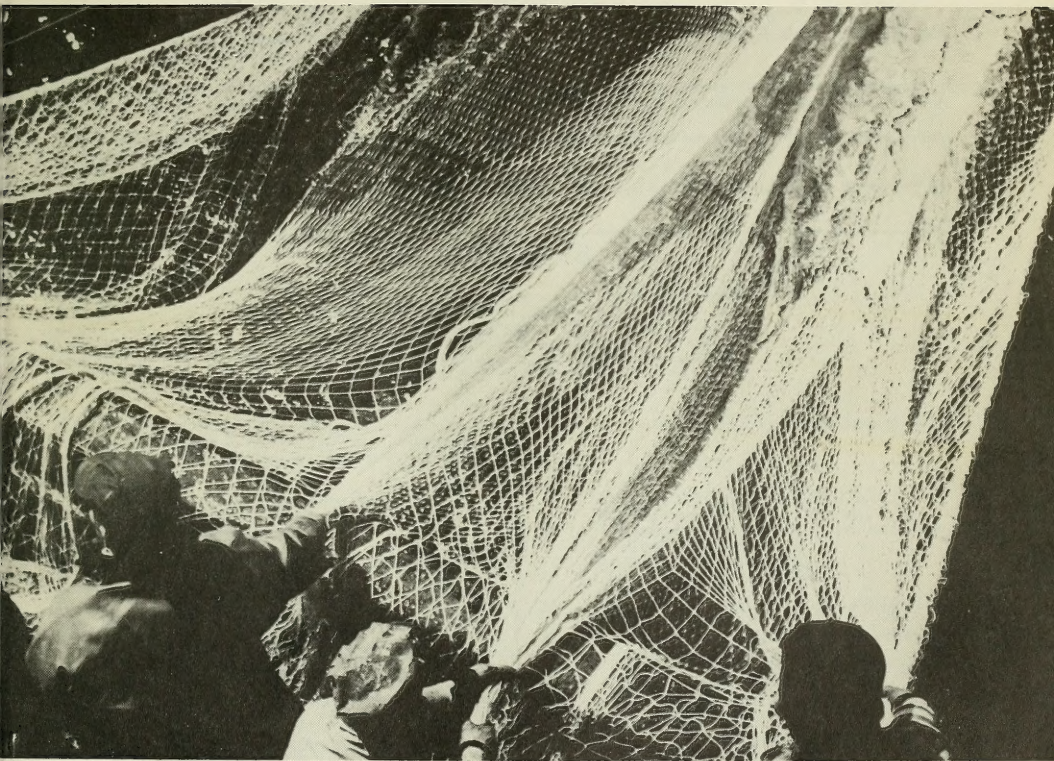




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ROBERT H. GIBBS, JR.

COMMERCIAL FISHERIES REVIEW



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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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SALMON REHABILITATION BY INDIANS

The name "Auke" means "little lake" in the Thlinget Indian language and refers to the lake that was in front of the glacier and which is now "Auke Lake" in Alaska.

It is related that in recent prehistoric times the local rising land mass created a barrier to salmon in the Auke Lake outlet and the Indians of the nearby Auke village set their slaves to work clearing the stream. The success of this salmon rehabilitation was so pleasing to the Indians that they sent the slaves back to their own villages. (Outdoor California, May 1961.)

Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, and Helen Parette

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EXPLORATORY FISHING OFF THE COAST OF NORTH CAROLINA, SEPTEMBER 1959-JULY 1960

By Robert Cummins, Jr.,* Joaquim B. Rivers,* and Paul J. Struhsaker*

ABSTRACT

Exploratory fishing with the U. S. Bureau of Commercial Fisheries chartered trawler Silver Bay was conducted at 435 stations along the continental shelf and slope off North Carolina during 5 cruises in 1959-60. Fishing gear used consisted of clam and scallop dredges, roller-rigged fish trawls, industrial-fish trawls, and shrimp trawls. The region investigated was found to be generally suitable for bottom trawling. With sand, sand and shell, and sand and mud bottoms predominating. Commercial concentrations of hard clams (*Merccenaria* sp.) were found near Bogue Inlet, and calico scallops (*Pecten gibbus*) in commercial concentration were found off Core Banks. Despite widespread exploratory coverage of the region with trawls, no large concentrations of commercial shrimp were found outside existing fishing grounds, nor were large catches of bottom fish made with any consistency. The presence within the region of commercially-important concentrations of pelagic fish (anchovies and herring-like species) was indicated by the occurrence of these fish in some of the bottom-trawl catches.

INTRODUCTION

In 1959, the U. S. Bureau of Commercial Fisheries established the South Atlantic Exploratory Fishing and Gear Research Station in Brunswick, Ga., with the primary objective of determining the fishery potential of the continental shelf and slope from Cape Hatteras, N. C., to Cape Canaveral, Fla. The 96.4-foot North Atlantic trawler Silver Bay, which had previously served the Bureau in the Gulf of Mexico (Captiva and Rivers 1960) and off the east coast of Florida (Bullis and Rathjen 1959), was rechartered for use by the Brunswick station.

Investigations in the region prior to 1959 had taken place largely in winter or spring and had been conducted almost entirely with either New England fish trawls (Powell 1950) or shrimp trawls. Results had not been encouraging. A brief resume of the explorations that took place in the region between 1940 and 1958, and of their results, is given by Bullis and Rathjen (1959). More extensive exploratory work, utilizing a wider variety of gear and extending coverage throughout the year, was needed to obtain practical data on the distribution and availability of the resources in the region for use by commercial fishermen.

During the first year of operations, therefore, the Silver Bay was used in a general survey of the resources of the entire region with several types of trawling and dredging gear. Cruises were made off North and South Carolina, Georgia, and Florida between 5 and 100 fathoms. Five of these cruises, conducted off the coast of North Carolina, provide the basis for this report.

REGION COVERED

The region investigated (fig. 1) lies on the continental shelf adjacent to the North Carolina coast from Cape Hatteras south. The coastline forming the shoreward edge of the re-

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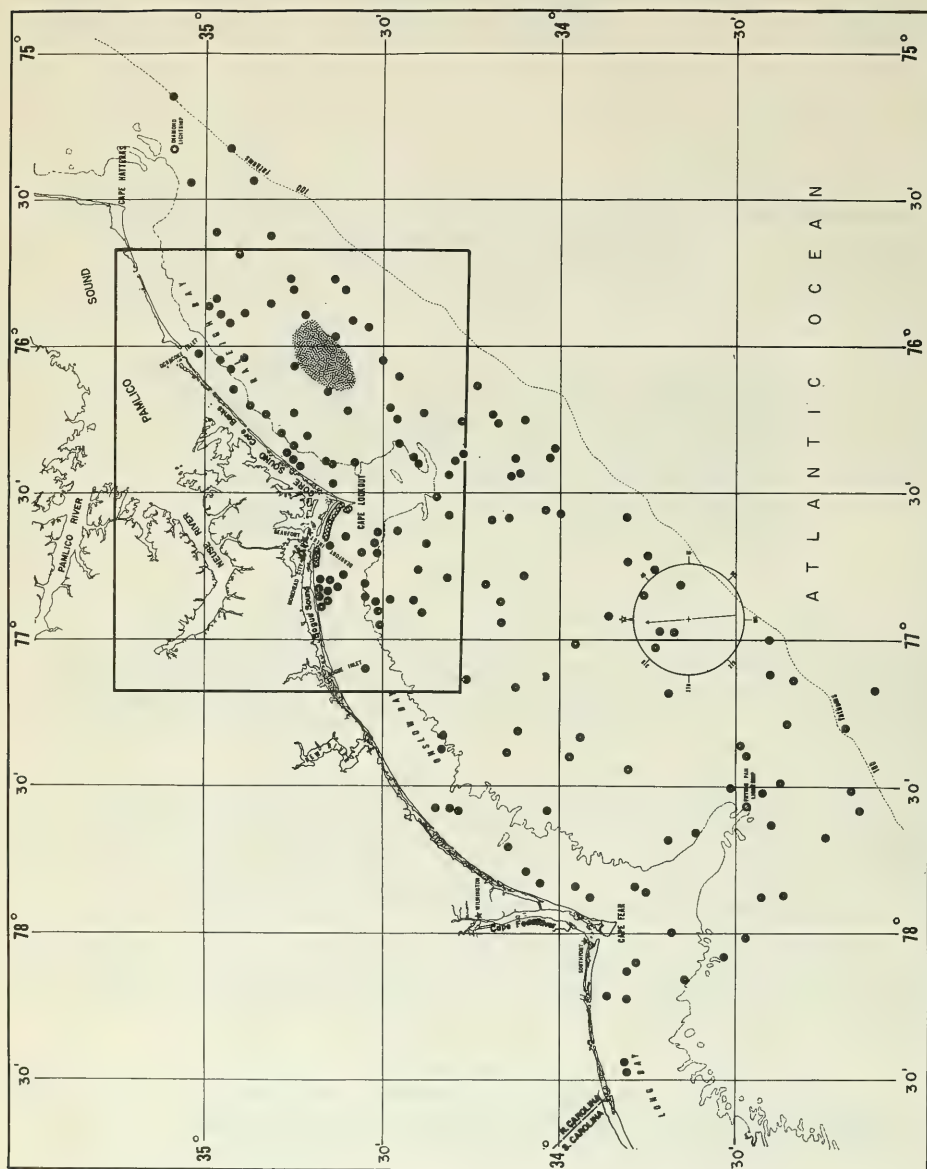


Fig. 1 - Portion of the continental shelf off North Carolina explored by the Silver Bay, 1959-60. Area within black lines enlarged in figure 2. Black dots signify trawl drags; stippled area, scallop bed; open circles, clam bed.

gion extends in a southwesterly direction from Cape Hatteras and is divided into two large bays, Raleigh and Onslow, by projections formed by Capes Hatteras, Lookout, and Fear. Each of the projections is accompanied by an extensive shoal--Hatteras by Diamond Shoals, Lookout by Lookout Shoals, and Fear by Frying Pan Shoals. Between the bays and the mainland proper lie the outer banks and an extensive series of sounds, the larger of which are Pamlico, Core, and Bogue. Oregon Inlet allows vessels to enter Pamlico Sound and its fishing ports; Beaufort Inlet provides a pass through the banks to the deep-water ports of Beaufort and Morehead City; and the Cape Fear River, emptying at Cape Fear, provides entrance to Southport and Wilmington. A small portion of a third large bay--Long Bay--is included in the region covered between Cape Fear and Little River Inlet.

The seaward edge of the region is formed by the 100-fathom curve which lies about 26 miles due east of the Cape Hatteras Light on the north end (at $35^{\circ}15' N.$, $75^{\circ}00' W.$), and extends from there in a somewhat more southerly direction than the mainland so that, at the southern end of the region, it is nearly 80 miles offshore on a line projected from the North Carolina-South Carolina boundary (at $33^{\circ}03' N.$, $77^{\circ}35' W.$). The region thus encloses more than 8,000 square miles of potential fishing grounds varying in bottom type, but predominantly sand, sand and shell, or sand and mud. Gravel and coral bottoms are encountered occasionally, but with care and proper choice of gear, gear damage can be held to a minimum.

The region constitutes a transition zone between the colder water regions to the north and the tropic-subtropic regions to the south and contains animal groups common to both. It should, therefore, be expected to contain more species, though not necessarily more individuals, than the adjoining regions to either side, a factor that influenced the choice of a wide range of gear for the investigations.

EXPLORATORY GEAR AND PROCEDURES

Because primary emphasis was on obtaining maximum year-round coverage of the entire region, fishing operations were carried out from the Silver Bay round the clock, in all weather conditions encountered, and on all bottom types.

Gear used consisted of (a) 14-tooth Fall River clam dredges, described by Tiller, Glude, and Stringer (1952); (b) 8-foot modified Georges Bank scallop dredges similar to those described by Posgay (1957); (c) roller-rigged fish trawls described by Knake (1956) and Captiva and Rivers (1960) and constructed of nylon; (d) 2-seam industrial-fish trawls described by Bullis, Captiva, and Knake (1960) and constructed of both nylon and cotton; and (e) shrimp trawls similar to those described by Bullis (1951). The bags of the clam and scallop dredges were constructed with 2-inch rings. Nylon liners of $1\frac{1}{2}$ -inch-mesh webbing were generally used in the scallop dredges.

Some modification of the 14-tooth clam dredges was necessary (Captiva 1960) because the Silver Bay could not be slowed to the dragging speed found to be optimal for operation of that gear in its original condition.

Where preliminary explorations indicated commercial concentration of a resource, additional drags were made for confirmation and, where warranted, simulated commercial dragging operations were carried out as time was available.

RESULTS OF EXPLORATORY FISHING

Most of the region surveyed is suitable for bottom trawling if rollers and chafing gear are used judiciously and depth-recorder tracings are watched. Gear damage during the explorations was minor. In all, 435 stations were fished.^{1/}

HARD CLAMS: Hard clams (*Mercenaria* sp.) were found in greatest abundance between Cape Lookout and a point about 4 miles west of Beaufort Inlet in depths of $3\frac{1}{2}$ to $7\frac{1}{2}$ fathoms (fig. 2). Following initial explorations in that general area, a series of 12 drags was made

^{1/}Including 10 night-light dip-net stations not considered further.

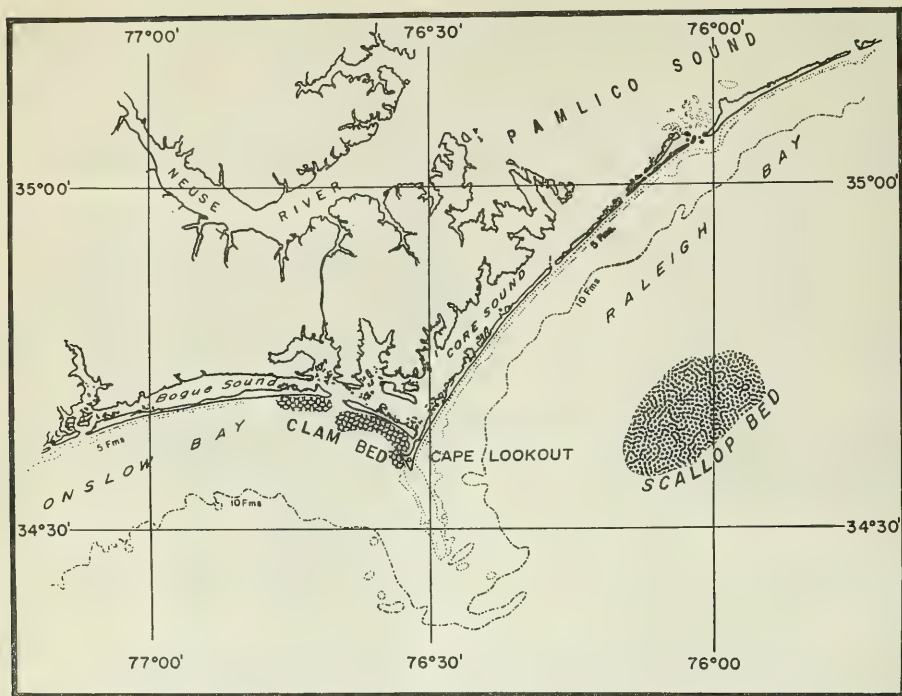


Fig. 2 - Enlarged section of region shown in figure 1, to better illustrate approximate location of clam and scallop concentrations outlined by work of the Silver Bay.

off Beaufort Inlet (at or near 34°39.7' N., 76°38.3' W.) in November 1959, to stimulate commercial operations. Results are shown in table 1. An over-all catch rate of $7\frac{1}{2}$ bushels of live clams per hour fished was obtained, with a maximum catch rate of 13 bushels per hour. The catches consisted primarily of chowder-size clams, 3 to 5 inches in length, averaging 1 gallon of meats per 90-pound bushel of stock. This yield is lower than those cited for ocean quahogs (Arcisz and Sandholzer 1947) and for hard clams in other areas--probably because of the extremely thick shells possessed by the North Carolina clams. A catch ratio of 1 live clam to 1 dead clam (2 half-shells) was obtained in the area. Some evidence of seasonal fluctuation in quantity of clams available is indicated by results of follow-up work done in the same area in February and March 1960, when the maximum catch rate was only 5 bushels of live clams per hour, but more extensive dragging must be done before the apparent trend can be proved or disproved. The Cape Lookout-Beaufort Inlet

Table 1 - Results of Simulated Commercial Fishing for Hard Clams with a Single Dredge Near Beaufort Inlet, N. C., November 29, 1960

Station Number	Minutes Fished	Depth (Fathoms)	Catch	
			Lbs. $\frac{1}{2}$	Whole Clams Bushels (90 Lbs.)
1434	35	6	700	$2\frac{1}{2}$
1435	35	$5-4\frac{1}{2}$	700	$2\frac{1}{2}$
1436	34	6	900	4
1437	33	$6-5\frac{1}{2}$	850	$3\frac{1}{2}$
1438	34	$5\frac{1}{2}-5$	875	3
1439	30	$5-3\frac{1}{2}$	40	(18 individuals)
1440	27	$3\frac{1}{2}-5$	725	3
1441	30	5-6	1,000	4
1442	30	$6-4\frac{1}{2}$	1,200	$5\frac{1}{2}$
1443	30	5	1,100	6
1444	30	5	1,200	6
1445	40	5	1,200	$6\frac{1}{2}$
Totals	388	-	10,490	$46\frac{1}{2}$

$\frac{1}{2}$ /Estimated weight. Includes dead shell.



Fig. 3 - A 14-tooth Fall River clam dredge coming aboard the Silver Bay with approximately 4 bushels of hard clams.

clam grounds are near shore and adjacent to a fishing port containing vessels that could be easily converted to clam dredging. In addition, an established clam-processing plant is available near the grounds.



Fig. 4 - A 14-tooth Fall River clam dredge coming aboard the Silver Bay with approximately 6 bushels of hard clams.

2/"Actual fishing time" is defined as the time the gear is actually on the bottom and in fishing position--"from dog-off to haul back."

Small numbers of clams (up to 24 individuals per drag) were taken near Bogue Inlet and near the mouth of the Cape Fear River, and numerous dead shell but no live clams were taken in the vicinity of Drum Inlet. In all 125 stations were fished with Fall River dredges in 49 hours of actual fishing time². Mud was by far the most productive bottom type dredged for clams. Accounts of established fisheries for hard clams include those by Arcisz and Sandholzer (1947) and Tiller, Glude, and Stringer (1952).



Fig. 5 - Unloading a catch of 45 bushels of hard clams after 6 hours fishing with a single dredge in the Beaufort Inlet area. Bed was discovered by the Silver Bay in November 1959.

CALICO SCALLOPS: The largest concentration of commercial-size calico scallops (*Pecten gibbus*) fished in the course of the explorations was found southeast of Core

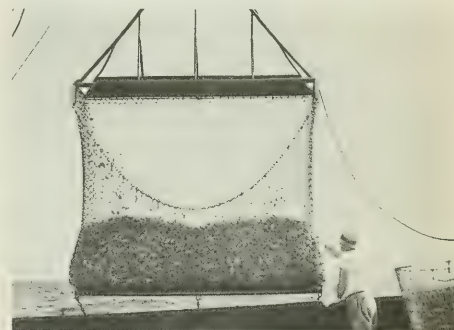


Fig. 6 - A 10-foot Georges Bank-type scallop dredge coming aboard the Silver Bay with approximately 40 bushels of calico scallops.

Banks (fig. 2). This concentration, centered at 34°32' N., 76°00' W., about 10 miles in length, and lying in the 17- to 20-fathom interval, was first noticed in September 1959, during exploratory shrimp trawling operations. Follow-up work with dredges in December resulted in maximum catches of only 3 bushels per 30-minute drag, but in February catch rates rose to a maximum of 16 bushels per 30-minute drag and in July to 19 bushels (table 2). The scallops taken were mostly large--from 2½ to 3 inches in shell diameter--but in contrast with large scallops on the Cape Canaveral bed (Bullis and Cummins 1961), the meats of the large Core Banks scallops were of uniformly high quality, firm, white, and palatable. Yields varied from an average of 5 pints per 75-pound bushel in September (trawl-caught scallops) to 3½ pints per bushel in December, 3½-4 pints per bushel in February, and 2½-3 pints per bushel in July. Whether or not the variations in availability and yield represent seasonal fluctuations cannot be determined on the basis of work accomplished to date. Despite the variations, however, scattered areas containing commercial significant amounts of scallops (yielding 5 or more bushels of scallops per

Table 2 - Summary of Fishing Results from Scallop Explorations by the Silver Bay at 37 Stations East of Core Banks, N. C.

Cruise Number	Station Number	Date	Depth in Fathoms	Minutes Fished	Scallop Catch/
18	12702/	9-12-59	20	60	1 bushel
	12732/	9-12-59	17	120	3½ bushels
20	1496	12-8-59	16	34	15 individuals
	1497	12-8-59	20	30	1 bushel
22	16292/	2-22-60	18/17	60	75 individuals
	1644	2-24-60	20/19	30	35 individuals
	1645	2-24-60	19	30	15 bushels
	1646	2-24-60	19	30	10 bushels
	1647	2-24-60	19	35	5 bushels
	1648	2-24-60	19	30	12 individuals
	1649	2-24-60	16	30	1 individual
	1650	2-24-60	16	30	6 individuals
	1651	2-24-60	16	30	3 individuals
	1652	2-24-60	21/20	30	-
	1653	2-24-60	18	30	6 bushels
	16542/	2-24-60	21/20	60	60 individuals
25	21702/	7-18-60	52/42	40	10 individuals
	21822/	7-20-60	52/42	45	37 individuals
	21832/	7-20-60	19/18	60	5 bushels
	2194	7-23-60	19	30	1 bushel
	2195	7-23-60	19	30	14 bushels
	2196	7-23-60	19	30	5 bushels
	2197	7-23-60	19	30	24 bushels
	2198	7-23-60	25	15	33 individuals
	2199	7-23-60	30	15	15 individuals
	2200	7-23-60	51/55	30	45 individuals
	2202	7-24-60	20	30	-
	2203	7-24-60	20	30	2 bushels
	2204	7-24-60	20	30	15 bushels
	2205	7-24-60	20	30	5½ bushels
	2206	7-24-60	20	30	-
	2207	7-24-60	18	30	50 individuals
	2208	7-24-60	18	30	10 individuals
	2209	7-24-60	20	45	19 bushels
	2210	7-24-60	18/17	30	4 individuals
	2211	7-24-60	15	30	-
	2212	7-24-60	12/14	30	-
Totals	37			1,339	95 bu. (approx.)

1/One bushel equals approximately 75 pounds.

2/Drags made with shrimp trawls. All others made with modified Georges Bank scallop dredges.



Fig. 7 - A roller-rigged nylon fish trawl coming aboard the Silver Bay with approximately 2,000 pounds of industrial fish.

1-hour drag with an 8-foot dredge) can be found on the bed over much of the year. The Core Banks scallop bed resembles the Cape Lookout-Beaufort Inlet clam bed in being near shore, near a fishing port with available vessels, and near a processing plant.

Dredging in other portions of Onslow Bay failed to produce scallops, although occasional individuals were taken in shrimp trawls in November 1959 in the Bay. In all, 53 stations were fished with scallop dredges in 26 hours of actual fishing time. Scallops were found in greatest abundance on bottoms consisting of a mixture of sand and shell.

SHRIMP AND FISH: Despite widespread coverage of the assigned region with shrimp trawls, large-mesh New England fish trawls, 2-seam industrial fish trawls, and scallop dredges (fig. 1), no large concentrations of commercial shrimp were found outside already-known grounds, and the occasional

large catches of fish that were made were interspersed with many smaller catches. A summary of the results of the 270 actual hours of fishing time spent at 247 trawl stations shows that total catches (the sum of fish, shrimp, and trash) were the highest in the portion of the 0- to 10-fathom depth interval investigated (table 3).

Table 3 - Summary of Trawl Explorations and Results, M/V Silver Bay, North Carolina, 1959-60

Depth Interval, Effort, & Catch ^{1/}	Cruise No. and Time of Year					Totals All Cruises
	No. 18 Sept.	No. 19 Oct.	No. 20 Nov./Dec.	No. 22 Feb./Mar.	No. 25 July	
0-10 Fathoms						
No. of Stations	43	7	8	14	24	96
Actual Fishing Time (hours)	50.28	7.63	9.17	14.00	24.46	105.54
Catch Rate ^{2/}	397.07	141.67	836.96	14.0	274.52	354.33
11-20 Fathoms						
No. of Stations	41	3	15	22	9	90
Actual Fishing Time (hours)	44.98	3.33	17.66	22.0	8.86	96.83
Catch Rate ^{2/}	185.07	18.18	714.43	119.18	942.43	251.98
21-30 Fathoms						
No. of Stations	12	1	6	4	8	31
Actual Fishing Time (hours)	12.78	2.00	7.0	4.0	8.41	34.19
Catch Rate ^{2/}	212.51	50.0	294.57	24.82	118.07	198.12
31-40 Fathoms						
No. of Stations	2	-	-	3	1	6
Actual Fishing Time (hours)	2.28	-	-	3.0	1.0	6.28
Catch Rate ^{2/}	24.12	-	-	154.00	29.00	86.94
41-50 Fathoms						
No. of Stations	2	-	1	-	1	4
Actual Fishing Time (hours)	1.38	-	1.0	-	0.66	3.04
Catch Rate ^{2/}	-	-	35.00	-	41.66	19.73
Over 50 Fathoms						
No. of Stations	10	-	1	6	3	20
Actual Fishing Time (hours)	9.16	-	1.5	9.50	4.58	24.74
Catch Rate ^{2/}	324.78	-	20.0	54.73	44.97	151.66
Totals						
No. of Stations	110	11	31	49	46	247
Actual Fishing Time (hours)	120.86	12.96	36.33	52.50	47.97	270.62
Catch Rate ^{2/}	281.49	129.08	617.01	124.89	183.51	271.55

^{1/}Includes all but scallops, clams, sponge, algae, and inert material.

^{2/}Pounds per hour (average).

SHRIMP: Exploratory catches along the North Carolina coast suggest that sizable concentrations of brown, pink, and white shrimp are infrequent or absent outside the limits of already-known commercial shrimp grounds, at least during the months in which explorations were conducted with the Silver Bay. In September 1959, occasional catches were obtained between Beaufort and Bogue Inlets in 5 to 8 fathoms that contained from 5 to 35 pounds of brown shrimp (Penaeus aztecus) measuring 21-25 count (heads off); and in July 1960, 1 additional catch in the same area was made that contained 40 pounds of mixed pink (Penaeus duorarum) and brown shrimp measuring 26-30 count (heads off). These catches, however, were interspersed with many others that were less productive or totally non-productive for shrimp. In other areas and other months only scattered individual brown, pink, and white shrimp were taken. Small numbers of rock shrimp (Sicyonia sp.) were found in many of the catches from portions of the region shallower than 25 fathoms.

FISH: Exploratory results indicate that only small-to-medium catches of fish can be expected with any degree of consistency in the region investigated over any prolonged



Fig. 8 - A roller-rigged nylon fish trawl coming aboard the Silver Bay with approximately 3,000 pounds of industrial fish.

period. Interspersed among the smaller catches resulting from drags made by the Silver Bay, however, were a few that ranged as high as 3,000 pounds per hour. These larger catches consisted primarily of small Atlantic croaker (Micropogon undulatus), spot (Leiostomus xanthurus), and butterfish (Poronotus triacanthus), usable only for industrial purposes. Outside of established fishing grounds, the largest catches were made in 5-12 fathoms in September, 12 to 14 fathoms in December, 17 to 100 fathoms in February and March, and 16 to 22 fathoms in July.

A few marketable food fish were taken--mostly flounders--but the proportion of these fish to those utilizable for industrial processing was low^{3/}. Sport fish were also noted on occasions, either as they appeared on the surface and were viewed from the vessel or as they were taken on trolling lines for biological study.

The occurrence of large anchovies (Anchoa sp.) and herring-like fish in some of the trawl catches indicates the possibility of an as-yet-unexplored midwater school fish resource that might prove to be of commercial value in the future.

SUMMARY

The continental shelf bordering the North Carolina coast south of Cape Hatteras contains over 8,000 square miles of potential fishing grounds. Preliminary fishery explorations on that portion of the shelf have revealed the following:

BOTTOM CHARACTERISTICS: Most of the shelf region explored is suitable for some type of trawling. Sand, sand and shell, and sand and mud bottoms are the most common.

CLAMS: Commercial concentrations of hard clams were found near Beaufort Inlet in depths of $3\frac{1}{2}$ to $7\frac{1}{2}$ fathoms. Catch rates ranged up to 13 bushels of clams per 1-hour drag and yields ranged to approximately 1 gallon per 90-pound bushel.

SCALLOPS: Commercial concentrations of calico scallops were found off Core Banks in depths of 17 to 20 fathoms. Catches ranged up to 19 bushels per 30-minute drag and yields reached a maximum of 5 pints per 75-pound bushel.

SHRIMP: No large concentrations of brown, pink, or white shrimp were found beyond the range of the present commercial fishery.

FISH: Individual catches of mixed fishes in commercial quantities were made. Such catches were neither consistent nor sustained over long periods of trawling. Quantities of pelagic fish of potential commercial importance were observed on depth-recorder traces, and a few of the fish occurred in bottom-trawl catches. Some sport fish were taken on trolling lines and others were observed in surface waters.

APPENDIX

A detailed fishing log showing geographic position, depth, date, catch components, and related data for each drag is available as an appendix to the reprint of this article. Write for Separate No. 636, which includes "Table 4--Fishing Log--North Carolina Fisheries Explorations, 1959-60; M/V Silver Bay."

LITERATURE CITED

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>ARCISZ, W., and SANDHOLZER, L. A.
1947. A Technological Study of the Ocean Quahog Fishery. <u>Commercial Fisheries Review</u>, vol. 9, no. 6 (June), pp. 1-21 (also Separate No. 176).</p> <p>BULLIS, H. R., Jr.
1951. Gulf of Mexico Shrimp Trawl Designs. U. S. Fish and Wildlife Service, Fishery Leaflet No. 394 (September), 16 pp.</p> | <p>_____, CAPTIVA, F. J., and KNAKE, B. O.
1960. Trawling Gear Designed for Industrial Fish Production. <u>The Fish Boat</u> (1960 Year Book), vol. 5, no. 3, pp. 18-21.</p> <p>_____, and CUMMINS, R. Jr.
1961. An Interim Report on the Cape Canaveral Calico Scallop Bed. <u>Commercial Fisheries Review</u>, vol. 23, no. 10 (also Separate No. 630).</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

^{3/}Regulations in North Carolina place a limit on the amount of non-food fish that can be brought in and landed by commercial trawlers when the principal objective of the cruise is shrimp or food fish.

LITERATURE CITED (Contd.)

- and RATHJEN, W. F.
1959. Shrimp Explorations off the Southeastern Coast of the United States (1956-1958). Commercial Fisheries Review, vol. 21, no. 6 (June) pp. 1-20 (also Separate No. 522).
- CAPTIVA, F. J.
1960. Equipment Note No. 6 - Chain Bridles and Accumulators Increase Effectiveness of "Fall River" Clam Dredges in Deep Water. Commercial Fisheries Review, vol. 22, no. 12 (December), pp. 20-22 (also Separate No. 607).
- and RIVERS, J. B.
1960. Development and Use of Otter-Trawling Gear for Red Snapper Fishing in the Gulf of Mexico, June 1957 - May 1959. Commercial Fisheries Review, vol. 22, no. 10 (October), pp. 1-14 (also Separate No. 600).
- KNAKE, B. O.
1956. Assembly Methods for Otter-Trawl Nets. U. S. Fish and Wildlife Service, Fishery Leaflet No. 437 (December), 29 pp.
- POSGAY, J. A.
1957. Sea Scallop Boats and Gear. U. S. Fish and Wildlife Service, Fishery Leaflet No. 442 (August), 11 pp.
- POWELL, D. E.
1950. Observations on the Commercial Fishing Potentialities in the Offshore Waters of North Carolina (January-February 1950). Commercial Fisheries Review, vol. 12, no. 7 (July), 7 pp. (also Separate No. 255).
- TILLER, R. E.; GLUDE, J. B.; and STRINGER, L. D.
1952. Hard-Clam Fishery of the Atlantic Coast. Commercial Fisheries Review, vol. 14, no. 10 (October), pp. 1-25 (also Separate No. 323).



PIRANHAS A PROBLEM IN BRAZIL'S INLAND WATERS

The experience an inland fresh-water biologist in Brazil is having with piranhas certainly belongs in the "If You Think You Got Troubles Department."

The biologist reports that for two years Argentina has had a serious problem with piranhas attacking cows at the Parana River Basin. Particularly in the marginal lagoons which abound with piranhas and where the oxen and cows must drink. Argentina is experimenting with timbo powder (with rotenone concentration about 5 percent) to eradicate piranha. The results appear doubtful because of the very high price of the powder and the large number of lagoons.

Within Brazil, particularly the northeastern part, in the dry region named "Nordeste-Poligono das Secas," the fight against piranhas in the dams, rivers and lagoon is a serious problem and the results are uncertain and expensive.

During 1959 15.9 tons of timbo was used to treat 4,073 small pools and 140 dams. Piranhas were found in 1,063 pools and in 21 of the dams.

It was during this operation against piranhas that 6 of the workers were wounded by Serrassalmus (that is the scientific name of several species of piranhas) and 12 other persons were mutilated when taking the piranhas after the water was treated with timbo. One worker almost died from the results of his mutilations. (Outdoor California, May 1961.)

SOFT-CRAB INDUSTRY

By Charles F. Lee* and F. Bruce Sanford**

The soft-crab industry is not numbered among the biggest of the fishing industries of the United States, but as will be shown later, it might well be the most unique. As to value, production of the soft and "peeler" crabs, according to the latest available statistics, amounts to just under two million dozen, worth over a million dollars at the vessel or boat level.

LOCATION

Historically, the Chesapeake Bay States of Maryland and Virginia have been the stronghold of the soft crab. In 1958 those states produced, by count, 90 percent of the catch (table 1). It will be noted, however, that this 90 percent represented only 72 percent of the value of the total catch, with Louisiana's 9-percent share of the production being worth 26 percent of the total value. This apparent sharp difference in value is explained by the fact that the price differential for size is considerable--big jumbo soft crabs may bring two or three times as much per dozen as do the small sizes. And the crabs grow big in the Louisiana bayous!

The rapidly expanding blue crab industry in the Southern states is attracting migrants from the Eastern Shore with the know-how to succeed with soft crabs, and we may well expect increased production of soft crabs in the South in the near future.

Table 1 - U. S. Landings and Ex-Vessel Value of Soft Crabs, 1958

State	Quantity		Value	
	No.	%	\$	%
Maryland	13,061,200	56.5	519,512	45.3
Virginia	7,762,176	33.6	303,438	26.5
Louisiana	1,977,395	8.6	297,170	25.9
North Carolina	228,000	1.0	21,415	1.9
Mississippi	69,972	0.3	2,456	0.2
New Jersey, Delaware, and Florida	16,700	-	1,945	0.2
Total	23,115,443	100.0	1,145,936	100.0

Source: From Fishery Statistics of the United States 1958, by E. A. Power, U. S. Bureau of Commercial Fisheries Statistical Digest No. 49.



Fig. 1 - Crabs that are soon to molt are more retiring than usual. Scrapes are the most effective way of taking them, but many are caught by one man in a small boat with a dip net as seen here.

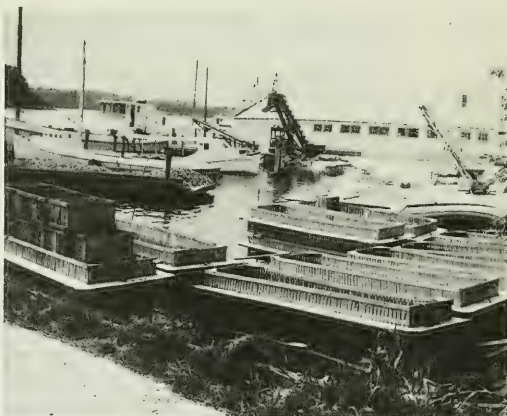


Fig. 2 - Floats such as are shown pulled out on shore are the usual way of holding crabs until the desired soft-shell stage is reached. Typically, the floats are secured in shallow water and are tended from narrow walkways or with a small skiff.

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U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
SEP. NO. 637

UNIQUE CHARACTER

The unique character of the industry derives from the fact that the soft crab is just a stage--a very short, transient one--in the life of the blue crab. All crabs molt, but the blue crab seems to be the only species with a behavior pattern that lends itself to exploitation during the soft-shell stage.

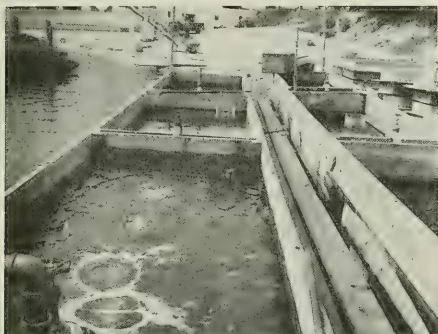


Fig. 3 - In this plant, an innovation in handling soft crabs has been tried and has proved effective in reducing losses in the floats. Permanent tanks are built over the water, and a pump aerates and exchanges the water in the holding tanks.

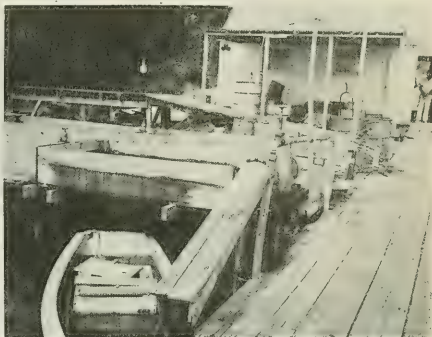


Fig. 4 - Only a small pump is needed to handle the six tanks. The boards protect the pump intake pipe. Note the box midships in the small crab boat moored at the dock. The crabs are held in the box to keep them cool during the run to the plant.

The successful operator of a soft-crab "shedding" plant needs skill that comes only from long experience. He must be able to select at a glance from among a scurrying mass of crabs, the "peelers" or those that are approaching the "buster" stage; that is, those that are starting to emerge from their shells.

Before beginning the molt, blue crabs are known as "green" or "fat" crabs, and show a fine white line on the outer segment of the "backfin." In a few days, this color changes to yellow, then pink. It is at this stage that they are known as "peelers" and are held in separate floats. "Red sign" immediately precedes the "buster" stage, and these crabs must be separated from the peelers to prevent them from being killed during the defenseless pe-

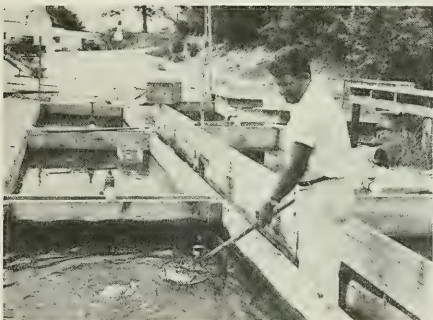


Fig. 5 - Dip nets are used to move the crabs from tank to tanks as needed. Water in the tanks is 6 to 8 inches deep, and each tank holds several hundred crabs.



Fig. 6 - The manager is holding crabs in the four stages that the watermen recognize and use to judge the time before molting actually starts. Called "white, yellow, pink, and red," the colors refer to a thin line on the edge of the "backfin" where the shell first splits open.

riod of shedding. Once their shell is gone, they must be removed from the water within an hour, or they begin to toughen and become "buckrams"--too tough to sell as soft crabs and too soft to cook and pick.

Fortunately, removal from the water indefinitely suspends the hardening process, and they can be packed and shipped as soft crabs. Most are shipped as fresh, live crabs, but an increasing number are being frozen, so this gourmet item can now be obtained at inland cities or during the off-season.

The physical condition of the peeler and soft crab is almost as delicate as its flavor, and to hold losses down, the operator of a soft-crab shed-

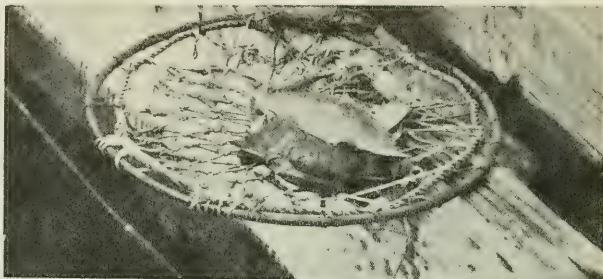


Fig. 7 - In the crab net is a "buster" crab, well on its way of working out of the old shell. This is the last stage before "harvesting."

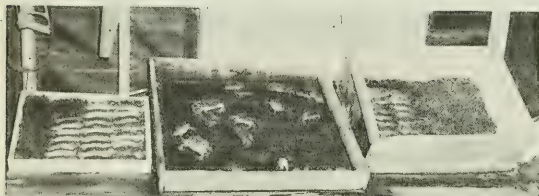


Fig. 8 - Within an hour after shedding, the soft crabs must be removed from the water and packed. The live crabs are sorted from the middle box. Small ones are on the right, large ones on the left.

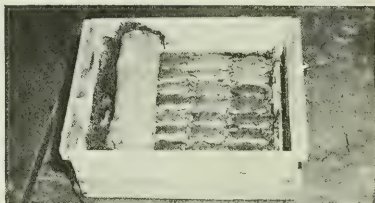


Fig. 9 - Crabs are packed carefully, nested in moist seaweed, and covered with special porous paper. If kept cool, they will live for several days when packed in this manner. The major demand is nearly in the big coastal cities, so the crabs reach market in excellent condition.

ding plant must keep almost a constant day-and-night watch over his floats. But to the born crab man, it's worth the effort. Nothing compares with the flavor of a soft crab, battered and fried just right.

Pictures can tell better than words the story of this unique industry.

Note: The authors gratefully acknowledge the assistance of Messrs. James and Walter Abbott, Northside Crab Company, Weems, Virginia, in the preparation of this report.



DRYING AND SMOKING OF FISH ANCIENT PROCESSES

"The drying and smoking of fish are ancient processes. Archaeologists and anthropologists tell us that drying and smoking were probably developed shortly after the discovery of fire and before man learned to make pictographs on rocks. The art of salt-ing is also very old, going back to the Stone Age. The use of vinegar and spices goes back, at least, to the Greeks and Romans."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 18 (page 1),
U. S. Fish and Wildlife Service.

TRENDS AND DEVELOPMENTS

North Pacific Fishery Research Vessels

A fleet of 15 research vessels was sent to sea by fishery agencies along the Pacific Coast during the spring, summer and fall of 1961. This was the largest high-seas research fleet ever mustered in the northeastern Pacific. The work of all vessels was in some way related to high-seas exploitation of salmon, king crabs, and bottom fish in the Bering Sea and North Pacific Ocean.



Fig. 1 - The seiner Marine View and schooner Paragon, two research vessels chartered by the U. S. Bureau of Commercial Fisheries to gill net salmon on the high seas. In port at Adak, Alaska, for net repairs and supplies.

This was the seventh season for the program of the International North Pacific Fisheries Commission (INPFC), representing part of the cooperative effort by Japan, Canada, and the United States. In this operation, the vessels Marine View, Windward, Paragon, and Bertha Ann, under charter to the U. S. Bureau of Commercial Fisheries, carried out studies of salmon and king crab distribution and collected samples for scientific analyses. The first two are purse seiners; the Paragon is a halibut schooner.

The Bertha Ann, a converted military refrigerated cargo carrier, represents an in-

novation. This steel vessel, about 170 feet in length, is able to operate in weather which stops the work of the smaller chartered fishing vessels. The Bertha Ann fishes gillnets and has proven her ability to operate successfully in bad weather. For the first time, winter operations will be possible.



Fig. 2 - M/V Bertha Ann, ready to leave for high-seas experimental gill-net fishing for salmon. The research vessel is chartered by the U. S. Bureau of Commercial Fisheries.

The purse seiners Renown, Commander, Ocean Pride, and Storm, chartered by the Fisheries Research Institute of the University of Washington, tagged salmon to provide information on migrations for the International North Pacific Fisheries Commission. Part of the INPFC program was to operate Japanese-type long lines for salmon from the Fort Ross, under charter to the Fisheries Research Board of Canada. Fish captured by this method have been successfully tagged by Japanese scientists. The Canadians brought an expert long-line fisherman from Japan to supervise operations on the Fort Ross.

Another innovation in 1961 was the trawling survey in the Gulf of Alaska. This was to determine whether bottom fishing, which may be carried out by Japan and Russia, will affect halibut resources fished by Canada and the United States. In this operation the purse seiners Arthur H., Victory Maid, Morning Star, and St. Michael were operated by the International Pacific Halibut Commission.

In addition, the Bureau of Commercial Fisheries chartered the halibut schooner Tordenskjold and operated its own exploratory fishing vessel, the John N. Cobb. Together these six vessels trawled over a broad area of bottom in the Gulf of Alaska extending roughly from the Shumagin Islands to Cape Spencer.

The 15-vessel fleet worked at points on the high seas from Cape Spencer almost to the end of the Aleutian Chain. Information essential to rational exploitation of the high-seas fisheries can be gathered only by going to sea. Information obtained by this seagoing scientific research will be invaluable in assessing the potential of traditional North American fishery resources and the adverse effects upon that resource of the growing high-seas fisheries of other nations.

--Ralph P. Silliman, Chief
Branch of Anadromous Fisheries,
Division of Biological Research,
U.S. Bureau of Commercial Fisheries,
Washington, D. C.



California

SHRIMP LANDINGS IN 1961

EXCEEDED 2 MILLION POUNDS:

California ocean shrimp landings for the 1961 season that ended October 31 totaled 2,006,274 pounds, slightly less than the 1960 record catch of 2,011,826 pounds, California's Department of Fish and Game reported on November 22, 1961.

The 1961 landings were composed of 1,206,847 pounds from the Crescent City area and 799,427 pounds from the Fort Bragg area. Compared with 1960, Crescent City landings were down 121,562 pounds but Fort Bragg landings were up 268,666 pounds.

No shrimp were landed in 1961 at either Bodega Bay or Morro Bay, where early season explorations showed the shrimp populations were scattered.

California's ocean shrimp fishery, established in 1952 following exploratory work by marine biologists of the Department of Fish and Game, has risen steadily to the two-million-pound annual total from the 1952 total of 205,485 pounds. The annual production is controlled by a State-imposed total quota.

However, this quota has not been a limiting factor to date.

* * * * *

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 61-N-15a & b-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (Sept. 5-8, 19-22, 1961) in the Carquinez Strait, Point San Pedro, and Half Moon Bay areas to (1) capture marked salmon fingerlings on their seaward migration; and (2) determine areas in the ocean where salmon fingerlings may be captured. A cotton midwater trawl with 15-foot opening and nylon midwater trawl with 25-foot opening were used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3:30 p.m. and each tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. A flowmeter was used to measure the amount of water strained by the net on each tow.

A total of 64 tows was completed in the Strait during this cruise yielding a catch of 10 king salmon (Oncorhynchus tshawytscha) fingerlings, none of which was marked. No rainbow trout (Salmo gairdneri) were captured.

Five deep trawls were made in the Strait to (1) determine if king salmon were migrating downstream in deeper water; (2) to test the performance of the new 25-foot nylon midwater trawl below the surface; and (3) to collect additional samples of an unidentified species of shrimp occurring in the Strait and Delta waters. No salmon were captured during the deep trawling tows. The net performed satisfactorily below the surface, and the species of shrimp sought was collected, although in smaller numbers than observed earlier in the year.

Other species appearing in the catch, listed in order of abundance, were northern anchovy (Engraulis mordax), striped bass (Roccus saxatilis), American shad (Alosa sapidissima), Pacific herring (Clupea pallasii), shrimp (Palaemon sp.), jack smelt (Atherinopsis californiensis), top smelt (Atherinops affinis), starry flounder (Platichthys stellatus), north-

ern midshipman (Porichthys notatus), and white sturgeon (Acipenser transmontanus).

The 25-foot nylon midwater trawl was used in an attempt to capture salmonfingerlings in ocean waters off Half Moon Bay. No salmon were taken in four trawls in that area.

Note: Also see Commercial Fisheries Review, Nov. 1961 p. 15.

ROCKFISH TAGGING CRUISE IN MONTEREY-SAN SIMEON INSHORE WATERS:

M/V "Nautilus" 61-N-16-Rockfish: The California Department of Fish and Game research vessel Nautilus cruised the inshore waters from Monterey to San Simeon, Calif., to (1) experiment with a mid-depth trawl in capturing blue rockfish, Sebastes mystinus; (2) capture blue rockfish by hook and line for tagging and for stomach and scale samples; and (3) make collections of other species of rockfish for taxonomic purposes.

Four 20-minute tows were made with a mid-water trawl having a 15-foot-square opening. It was towed at depths ranging from 20 to 70 feet and at speeds of 2 to 5 knots. No blue rockfish were captured even when the net was towed through areas where hook-and-line angling indicated their presence. Only one fish, an electric ray (Torpedo californica), was taken in the net. Jellyfish formed the bulk of the catch. Several salps were noted.

In all, 868 blue rockfish were tagged. Most required decompression, i.e., removal of air from the air bladder to equal surface pressure. All were anesthetized in a 1/15,000 solution of M.S. 222. Only a few required repositioning of the stomach, i.e. pushing the stomach back into place with a plastic rod through the mouth. The fish were caught from the surface to over 100 feet.

The purpose of the tagging program is to determine whether the blue rockfish entering the sport fishery off central and northern California are from one intermingling population or from separate sub-populations.

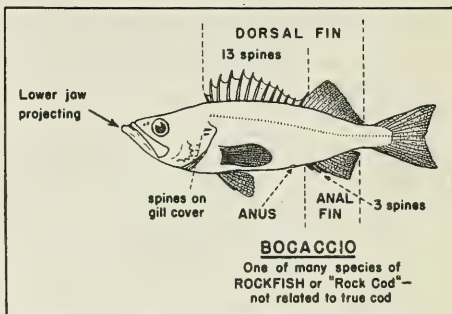
Stomachs and scales were collected from 66 specimens and, in addition, stomachs were obtained from 13 lingcod (Ophiodon elongatus).

The next most frequent fish caught was the olive rockfish (S. serranoides). Large concentrations were encountered in about 25 fathoms west of Pt. Sur.

Unusually large concentrations of lingcod hampered tagging operations off Point Piedras Blancas and northwest of Cape San Martin.

Copper rockfish (Sebastes caurinus), canary rockfish (S. pinniger), gopher rockfish (S. carnatus), and yellowtail rockfish (S. flavidus) were collected for taxonomic studies.

Other fish caught by hook and line included vermilion rockfish (S. miniatus), turkey-red rockfish (S. ruberrimus), starry rockfish (S. constellatus), rosy rockfish (S. rosaceus), China rockfish (S. nebulosus),



bocaccio (S. paucispinis), black rockfish (S. melanops), cabezon (Scorpaenichthys marmoratus), jack mackerel (Trachurus symmetricus), Pacific mackerel (Pneumatophorus diego), Pacific sand dab (Citharichthys sordidus), and rock sole (Lepidopsetta bilineata).



Cans--Shipments for Fishery Products, January-September 1961

Total shipments of metal cans during January-September 1961 amounted to 98,535 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 97,915 tons in the same

period of 1960. Canning of fishery products in January-September this year was confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of shrimp and Maine and California sardines were down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Films

TWO HISTORIC FISHERY AREAS TO BE SUBJECTS OF NEW FILMS:

Two of the finest fishing areas, each a great contributor to United States history, will be subjects of motion pictures to be produced by the U. S. Bureau of Commercial Fisheries.

One of the areas is Chesapeake Bay, between Maryland and Virginia. The other is the Columbia River, in the Pacific Northwest. Both pictures will feature the historic and present importance of the fishery resources of the areas, together with other activities and events of special interest.

The Chesapeake Bay picture will be made by ACI Productions, New York City. It will be a 16 mm. sound-color film approximately 28 minutes long. The States of Maryland and Virginia are cooperating with the Bureau in sponsoring the film. Production will be under the direction of the Bureau. Since fishery activities are to be shown for all seasons, the picture will be about a year in the making.

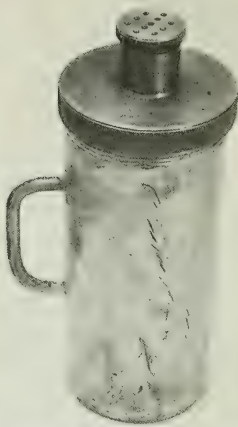
The Columbia River picture will be made by the Motion Picture Division of Walter J. Klein Company, Charlotte, N. C. It also will be a 28-minute, 61 mm. sound-color film. It will be an educational and documentary picture of the commercial fisheries of the Columbia River, featuring the salmon fishery, dams, spillways, electric generators, fishways, and modern hatcheries and laboratories. This film likewise will be a year in production in order to depict the ever-changing salmon activities in the River.



Gear

DEVICE FOR RECORDING NET DEPTH:

An instrument which graphically records depth as a function of time has been developed by the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, Calif. The device was designed for use on tuna purse seines. However, it should be readily adaptable for gill nets and other applications where instantaneous telemetered depth information is not required.



Device for recording depth.

The pressure-sensing device is an "O" ring sealed, spring loaded, piston available in various diameters depending upon the maximum anticipated depth. The recording paper is attached to a drum which is rotated by a clock. The device is made of aluminum, is less than 21 inches long and of near neutral buoyancy. It is rugged enough to survive riding the lead line of a purse seine while the net is being set. The clock starts automatically upon submersion.



Great Lakes

JOINT EFFORTS TO BRING BACK LAKE TROUT TO UPPER GREAT LAKES:

Joint efforts under way to bring lake trout back to the upper Great Lakes gained more momentum in October 1961



when some 4,120,000 green lake trout eggs were taken from brood stock at the Michigan Conservation Department's Marquette hatchery. About 100,000 of the eggs will be hatched and reared for plantings in Michigan's inland lakes.

Yearling trout to be raised from the remaining bulk of eggs are scheduled for release in Lakes Michigan, Huron, and Superior in 1963 under a massive program of lamprey control and fish restoration coordinated by the Great Lakes Fishery Commission (GLFC), the Michigan Department of Conservation reported early in November 1961.

The GLFC, made up of conservation officials from Ontario, the United States Government, and Great Lakes States, has set an annual planting goal of 7 million yearling lake trout in the upper Great Lakes as soon as lampreys are brought under control.

The U. S. Bureau of Commercial Fisheries completed the first series of chemical attacks on lampreys in Lake Superior streams in November 1960. It will continue to operate electrical weir barriers through 1962 on major lamprey-producing streams to measure results of treating and to capture adult lampreys that went into Lake Superior before the streams were treated.

The Bureau hopes to complete the first round of treatment in all lamprey streams tributary to Lakes Michigan and Huron within the next four years.

The October 1961 spawn take at Marquette hatchery is the highest made there since 1959 when plantings were launched experimentally under the lake trout rehabilitation program. Just two years earlier, only 950,000 eggs were collected at the hatchery. In 1960, the hatchery's output rose to 2,450,580 eggs.

Michigan Department fisheries officials report the hatchery's brood stock has built up to a point where it is no longer necessary to net inland lakes for spawn to meet needs of the Great Lakes planting program. Six inland lakes were netted in recent years for egg collection, but efforts in those waters proved uneconomical as compared with spawn-taking operations at the hatchery.

Some 39,000 lake trout were planted in eight lakes of Michigan's northern lower peninsula in the fall of 1961, the Michigan Conservation Department reported. The plantings were made up of two-year-olds averaging seven inches in length.

The U. S. Bureau of Commercial Fisheries reported that its chemical attack against lampreys in East Bay at Grand Marais, Alger County, Michigan, was completed early in November 1961, but results of the highly-potent treatment are not yet fully known.

Some of the lamprey larvae were still alive in test cages set out in the Bay. A relatively small number of game fish was killed by the treatment. Between 50 and 80 rainbow trout, a low number of northern pike, and some perch were killed. Mortality was highest among suckers and minnows.

Federal fisheries men netted the Bay prior to treatment in an effort to salvage as many game fish as possible.

Samples of the Bay's bottom soil will be taken to help determine how hard lamprey larvae were hit in the Bay and its connecting channel by a concentrated solution of toxaphene which was pumped into the waters for two weeks early in November.

The Bureau continued to conduct netting work between the east and west bays to study effects of the treatment. An electric beam trawl will be used in spring 1962 to further size up the lamprey larvae situation.

As in the case of actual treatment, studies will be complicated by the large body of water involved. Previously, the chemical war on lampreys has been waged only in streams.

Treatment of the Bay was approved by Michigan's Conservation Department Director following a public hearing held in Munising in which plans for the project were outlined and favorably received by local residents.



Great Lakes Fisheries

Exploration and Gear Research

EXPLORATORY FISHING VESSEL "KAHO" COMPLETED:

The new 65-foot Great Lakes exploratory fishing and gear research vessel *Kaho* was accepted by the U. S. Bureau of Commercial Fisheries from the construction contractor on October 31. Trial runs were conducted the same day and they revealed that the *Kaho* has a top speed of 12 knots, comfortable sea characteristics, and a high degree of maneuverability.

The vessel was completed approximately 5½ months after the contract for construction was awarded.

After a series of shakedown runs in Lake Erie to familiarize vessel personnel with operational characteristics and equipment, the *Kaho* left her base at Saugatuck, Mich., on November 16, 1961. The first of two trawl exploration cruises, scheduled for Lake Michigan during the remainder of 1961, was started on November 27, 1961.



Great Lakes Fishery Investigations

LAKE ERIE STUDIES TO DETERMINE LENGTH AND AGE OF FISH AT END OF GROWING SEASON, OCTOBER 1961:

Vessel operations for October 1961 were confined to the fall 3 day-night series of trawl hauls at Stations 49 (Bono) and 4 (East

Harbor) and to the biweekly visits at Station 5 (Sandusky Bay). Major emphasis was on the determination of the average lengths of fish of different species and ages at the end of the growing season.

During the 3 day-night trawling series (which duplicated similar spring and summer series), two 10-minute tows were made at each of 3 depths, during the morning, afternoon, and evening (total of 54 tows at each station). Data from collections during the 3 seasonal series will be tabulated to provide information on the relative abundance, distribution, and periodic growth of the more prominent species and age groups during 1961.

More fish were taken at Bono than at East Harbor during the fall series, primarily because of a greater abundance of yearling and 2-year-old yellow perch at Bono. Catches of young-of-year fish were somewhat sporadic in both areas although yellow perch, white bass, alewives, and spot-tail shiners were caught rather consistently. With the cooling of water temperatures, smelt of all age groups have again returned to the western basin and were taken in varying numbers. Only 14 young-of-year yellow pike or wall-eyes, averaging 8.7 inches in length, were collected at the two stations.

Trawling in Sandusky Bay produced good catches both in numbers and variety. The average number of fish caught per tow was 505, of which about 75 percent were young-of-the-year. Young-of-year channel catfish were especially well represented.

Surface water temperatures in the western basin decreased from 66° to 57° F. between October 10 and October 27. Completion of the fall overturn early in the month brought a return to normal dissolved-oxygen conditions in the deeper areas of the central basin.

The semiannual collection of scale samples from major species in the commercial catch was resumed in late October at Ohio ports. Other collections were to be made at Wheatley, Ontario; Erie, Pa.; and Dunkirk, N. Y.

* * * * *

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 8, October 10-24,
1961: Strong winds, even more persistent

than usual for October, forced a drastic reduction in activities scheduled for cruise 8. Operations were restricted to State of Michigan waters of northern Lake Michigan.

Gangs of nylon gill nets (50 feet each of 1½- and 1½-inch mesh, 100 feet of 2-inch mesh, and 300 feet each of 2½, 2½, 2½, 3-, 3½-, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Charlevoix and Frankfort and for 2 nights at 80 fathoms off Frankfort. Chubs (*Leucichthys hoyi*) and alewives were the predominant catches in the Charlevoix area. Chubs at 50 fathoms and alewives at 25 fathoms. A number of smelts and a few yellow perch, white sucker, and other species of chubs were also caught. In the Frankfort area, catches consisted of nearly all chubs (*L. hoyi*) at 25, 50, and 80 fathoms.

The vastly different catches between each 25-fathom set made in the Charlevoix and Frankfort areas may be explained by the great difference in thermal conditions in the areas in which the nets were set. Off Charlevoix the water was homothermous at about 60° F. from top to bottom; this accounted for the catch of yellow perch and white suckers which prefer warm water and the near absence of chubs, and may also have contributed to the large alewife catch. Off Frankfort the thermocline was distinct and the bottom temperature of about 40° F. was more favorable for chubs.

In half-hour bottom tows with a 50-foot balloon trawl at 15, 25, 35, and 50 fathoms off Frankfort, chub catches were 0, 477, 292, and 452 pounds, respectively. All hauls caught alewives (up to 57 pounds at 50 fathoms), and the 50-fathom tow took 190 pounds of deep-water sculpins. The 15-fathom tow caught only a few pounds of alewives and smelt (mostly young of the year) and 5 yellow perch. (The average length of the young of both smelt and alewives was about 2.5 inches.) A 30-fathom tow in Little Traverse Bay (east of Charlevoix) took only 20 pounds of chubs and a few smelt and alewives.

Limnological collections and observations were made at 40-fathom stations off Charlevoix and Frankfort, and at 40 fathoms in mid-lake between Charlevoix and Manistique. Thermal conditions in the lake were very unstable, as high winds resulted in the movement of large water masses. Homothermous conditions from surface to bottom as low as 40° F. and as high as 60° F. were observed

in 25 fathoms of water. In most areas, however, some thermal stratification remained. After a northeast gale near the end of the cruise, an upwelling developed off Frankfort which extended at least 5 miles offshore and in which the surface water temperature was about 40° F. Extremes of surface temperatures during the cruise were 39.2° and 60.8° F. (4.0° and 16.2° C.).

* * * * *

FALL DISTRIBUTION OF FISH IN LAKE SUPERIOR STUDIED:

M/V "Siscowet" Cruise 7: Fall environmental conditions were studied at 3 limnological stations in the Apostle Islands region of Lake Superior--southeast of Stockton Island, northeast of Bear Island, and east of Pike's Bay--September 12-October 2, 1961. Limnological collections included records of water temperature, Secchi-disc readings, water samples for chemical analyses, and bottom and plankton samples. The water was nearly homothermous at all depths above 20 fathoms. Temperatures ranged largely between 50° and 55° F; this represented about a 10-degree increase in bottom temperatures and nearly a 15-degree decrease in surface temperatures since midsummer. Fishery studies included the collection of information on the fall distribution of whitefish, lake herring, and chubs, and on the distribution, survival, and growth of hatchery-reared lake trout. Experimental fishing gear was operated at the following locations: east of Gull Island; Punky Bay; Frog Bay; southeast of Michigan Island; southeast of Stockton Island; Pike's Bay; east of Basswood Island; southeast of Oak Island; west of Ironwood Island; northeast of Cat Island; and west of Outer Island.

In an attempt to locate small, immature lake herring, a gang of 4 gill nets (1½-, 1½-, 2-, and 2½-inch mesh) was suspended 30 feet below the surface in water 14 to 44 fathoms deep at the Gull and Michigan Island stations. The catch from 3 sets was 156 lake herring (37 immature), 17 chubs, 9 smelt, and 1 sculpin.

A standard gang of gill nets (1- to 5-inch mesh) set at 25 fathoms southeast of Stockton Island caught 383 bloaters and smaller numbers of smelt, burbot, whitefish, lake herring, and lake trout.

Trawl tows in the Apostle Islands region at depths ranging from 12 to 30 fathoms

yielded, in addition to lake trout, generally small numbers of smelt, chubs, sticklebacks, and sculpins. Unusual catches from single 15-minute tows were: 519 smelt in Pike's Bay; 278 bloaters in Frog Bay; and 30 yearling alewives northeast of Cat Island.

To date the Siscowet captured 141 small lake trout (excluding yearlings) in the Apostle Islands region; 124 (88 percent) were fin-clipped and 92 (74 percent) of the hatchery-reared fish were from the 1960 Bayfield plant (average increase in length since planting in June 1960--3.1 inches).

During the cruise the Siscowet recaptured 150 yearling lake trout representing 3 stocks planted in close proximity among the Apostle Islands by the Wisconsin Conservation Department in June 1961.

Although the total number of recoveries is too small to permit definite conclusions, these early returns suggest a relatively better survival of the lake trout reared at Pendills Creek than of the fish reared at Bayfield. The growth of 0.8 and 0.7 inch for the lake trout reared at Bayfield and Pendills Creek is closely comparable to the growth (0.7 inch) observed in August for the lake trout from the 1961 Keweenaw Bay plant.

* * * * *

LAKE TROUT SPAWNING POPULATIONS ASSESSED IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR:

M/V "Siscowet" Cruise 8: The annual assessment of spawning populations of lake trout in the Apostle Islands region of Lake Superior was made October 16 to 22, 1961. A total of 34,800 feet of large-mesh gillnets (32,400 feet of 6-inch mesh and 2,400 feet of 5-inch mesh) were fished at depths of 3½ to 12 fathoms on Gull Island Shoal, between Michigan and Gull Island, and just east of Michigan Island. Only 17 lake trout were captured, all of which were ripe males. The fish ranged in length from 20.2 to 30.2 inches (average, 25.1 inches); 8 of the trout bore healed lamprey scars but none had fresh scars. Eleven of the trout were tagged and released. (The Wisconsin Conservation Department's research vessel Salmo fished 32,000 feet of 5- and 6-inch mesh gill nets on other lake trout spawning grounds--off Rocky, Manitou, Ironwood, Cat, and Stockton Islands--with similar results. Fifteen ripe male lake trout, but no females were

caught; no fresh lamprey scars were observed.)

Small-mesh gill nets (150 feet each of $1\frac{1}{2}$ - and $2\frac{1}{2}$ -inch mesh) which were fished with the large-mesh nets on Gull Island Shoals caught 298 longnose suckers, 27 lake herring, 18 round whitefish, 2 burbot, and 1 yellow perch. No fish eggs were found in the stomachs of about 50 suckers which were examined.

Ages were determined for 29 of the lake trout captured by the research vessels *Salmo* and *Siscowet*. The number of fish in each of 5 age groups which were represented was: V, 8; VI, 17; VII, 2; VIII, 1; and IX, 1.

Water temperatures on the lake trout spawning reefs ranged from 47.5° F. to 50.4° F.



Gulf Exploratory Fishery Program

UNDERWATER OBSERVATIONS OF SHRIMP TRAWLS IN ACTION CONTINUED:

M/V "George M. Bowers" Cruise 35 (October 12-22, 1961): Underwater observations of shrimp trawls in action were continued in the Gulf of Mexico by the *George M. Bowers*, exploratory fishing vessel of the U. S. Bureau of Commercial Fisheries. Measurements of a 40-foot four-seam semi-balloon shrimp trawl were obtained with 4 door sizes (5 foot, 6 foot, 7 foot, and 8 foot) at various speeds and scope ratios.

The configuration of this design was measured for trawls constructed from cotton as well as from nylon webbing. These measurements and strain measurements of the various components of the trawling assembly are to be made also of the other basic shrimp trawl designs.

Observations and movies of a shrimp trawl operating on loggerhead sponge and coral bottom were made in the Carabelle (Florida) area.

Data collected during this and previous cruises concerning underwater observations of shrimp trawls in action are being analyzed at the Bureau's Exploratory Fishing and Gear Research Base, Pascagoula, Miss.

Note: See *Commercial Fisheries Review*, Dec. 1961, p. 32.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-9: A series of 12 tows of 3 hours each equally divided between two statistical areas and depth ranges were made with a 45-foot shrimp trawl by the U. S. Bureau of Commercial Fisheries chartered research vessel *Belle of Texas* operating from the Bureau's Biological Laboratory in Galveston, Tex., during November 7-10, 1961. The results were nearly negative with only small quantities caught in both statistical areas. In one statistical area (F&WS Grid Zone 15) for each 3-hour tow in the depth range up to 25 fathoms only 22 pounds (heads-on) of shrimp were caught; only 8 pounds were caught in the depth range of 25-60 fathoms. The size caught in the the depth range up to 25 fathoms was 21-25 count heads-off, almost evenly divided between white and brown. In the depth range of 25-60 fathoms, the size was 15-20 count heads-off, all brown.

In the second statistical area (Grid Zone 16), in the depth range up to 25 fathoms only 13 pounds (heads on) of shrimp were caught, almost equally divided between white and brown, per 3-hour tow. The size of the brown shrimp was 26-30 count (heads off) and the size of the white was 21-25 count. In the 25-60 fathom range in the second statistical area, only 18 pounds of brown shrimp were caught, 12-15 count (heads off).

M/V "Belle of Texas" Cruise BT-10 (November 15-17, 1961): The M/V *Belle of Texas* made another series of six tows equally divided between two statistical areas and two tows in each depth range with a 45-foot shrimp trawl. In the first (Grid Zone 19) of the two statistical areas covered, only 17 pounds of shrimp (heads on) were caught in the depth range up to 20 fathoms, mostly brown shrimp 26-30 count (heads off). In the 20-40 fathom range 66 pounds of brown shrimp were caught, 21-25 count. In the 40-60 fathom range, only 3 pounds of brown shrimp were caught, 21-25 count.

In the second (Grid Zone 20) of the two statistical areas, 120 pounds of shrimp were caught in the depth range up to 20 fathoms, mostly white shrimp 21-25 count. Only 1

pound of brown shrimp 21-25 count was caught in the 20-40 fathom zone; and 27 pounds of 15-20 count brown shrimp were caught in the 40-60 fathom range.

Note: See Commercial Fisheries Review, December 1961 p. 32.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-OCTOBER 1961:

Landings of skipjack tuna in Hawaii during October 1961 were about 530,000 pounds, or about 130,000 pounds below the 1948-60 average landings for the month.

Length measurements in October showed little change in size composition of the catch from that observed during the latter part of September. Modal groups were centered around 48 cm., 63 cm., and 79 cm. (5.0, 12.5, and 26.9 pounds, respectively), with the 63 cm. mode dominant. Partial gross receipts show a similar picture, with the sizes less than 8 pounds, 8-15 pounds, and over 15 pounds making up 22 percent, 37 percent, and 41 percent of the landings, respectively.

Total estimated landings for January-October 1961 were 10.9 million pounds. On this basis, it was estimated that total landings for the year would be about 11 and 12 million pounds (compared with an average of 10 million pounds).



Industrial Products

U. S. FISH MEAL, OIL, AND SOLUBLES PRODUCTION, JANUARY-OCTOBER 1961:

The production of meal and oil during October 1961 was less than October 1960. However, the quantity processed during January through October 1961 was greater than during the same period of last year.

During October 1961, fish meal production amounted to 16,900 tons--81 percent from menhaden; fish solubles and homogenized fish amounted to 8,400 tons; and the production of marine-animal oils totaled 1.9 million gallons--90 per-

cent from menhaden. Compared with October 1960, the meal production was down 30 percent, and marine animal oil dropped 37 percent.

The quantity of fish meal processed during the first 10 months of 1961 amounted to 265,500 tons--8,300 tons above the same period of the previous year. Fish solubles and homogenized fish production totaled 100,000 tons--7,500 tons greater than the 10-month period of 1960. Production of marine-animal oils during the first 10 months of 1961 amounted to 30.5 million gallons--5.3 million gallons above the same period last year.

Imports of fish meal during January through September 1961 (159,100 tons) were 64 percent more than during the same period of 1960, while imports of fish solubles (2,500 tons) were 11 percent below the 1960 9-months total. Exports of fish oils and fish-liver oils during the 9-month period of 1961 of 95.4 million pounds (12.7 million gallons) dropped 13.4 million pounds or 1.8 million gallons compared with the same period of 1960.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, January-October 1961

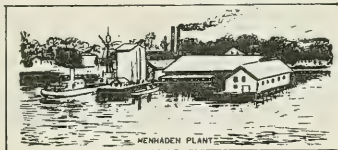
Product	Jan.-Oct.		Total
	1961	1960	1960
.....(Tons).....			
Fish meal and scrap:			
<u>Alewife</u>	89	1,092	1,092
<u>Herring:</u>			
Alaska.....	3,576	6,103	6,103
Maine.....	1,050	2,512	2,515
Menhaden 1/.....	230,486	204,184	218,423
Sardine, Pacific.....	2/ 1,397	2,331	3,301
Tuna and mackerel.....	2/ 17,191	22,582	26,325
Unclassified.....	11,708	18,288	21,279
Total.....	265,497	257,192	279,438
Shellfish and marine animal meal and scrap.....	3/	3/	10,309
Grand total meal and scrap.....	3/	3/	289,747
Fish solubles.....	89,534	83,111	89,377
Homogenized condensed fish.....	10,487	9,397	9,552
.....(Gallons).....			
Oil, body:			
<u>Alewife</u>	6,900	66,121	66,121
<u>Herring:</u>			
Alaska.....	625,786	1,385,218	1,385,218
Maine.....	4/	130,293	132,973
Menhaden 1/.....	28,237,949	21,981,419	24,453,736
Sardine, Pacific.....	2/ 37,243	123,427	143,654
Tuna and mackerel.....	2/586,860	413,846	507,180
Other (including whale)....	1,026,866	1,088,092	1,137,527
Total oil.....	30,521,604	25,183,416	27,826,409

1/Includes a small quantity produced from thread herring.

2/Data furnished by the California Department of Fish and Game, Marine Resources Operations.

3/Not available on a monthly basis.

4/Included in "other" in order to avoid disclosure of the production of individual firms.



U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1961: Based on domestic production and imports, the United States supply of fish meal for the first 9 months of 1961 amounted to 408,000 tons--77,000 tons above the same period of 1960. Domestic production was 15,000 tons and imports 62,000 tons greater than for the same period in 1960. Peru continued to lead other countries as the principal source of imports with shipments totaling nearly 105,000 tons during the first 9 months of 1961.

All factors indicate that the total United States supply of fish meal in 1961 will exceed the peak year of 1959 when the quantity amounted to nearly 440,000 tons.

U. S. Supply of Fish Meal and Solubles, January-September 1961 with Comparisons			
Item	January-September		Total 1960
	1961	1960	
..... (Short Tons)			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	216,834	183,849	218,423
Tuna and mackerel	15,416	20,705	26,499
Herring, Alaska	3,576	5,103	6,103
Other	12,819	22,443	39,112
Total production	1/248,645	1/233,100	290,137
Imports:			
Canada	31,194	27,546	30,982
Peru	104,522	51,093	68,156
Chile	10,078	12,148	21,183
Angola	1,543	360	888
Republic of South Africa	10,526	5,829	7,073
Other countries	1,277	357	3,279
Total imports	159,140	97,333	131,561
Available fish meal supply	407,785	330,433	421,698
Fish Solubles:			
Domestic production 2/	91,603	85,316	98,929
Imports:			
Canada	859	809	869
Denmark	28	1,858	1,858
Other countries	1,621	165	447
Total imports	2,508	2,832	3,174
Available fish solubles supply	94,111	88,148	102,103
1/ Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.			
2/ 50 percent solids. Includes production of homogenized-con- densed fish.			

1/Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.
2/50 percent solids. Includes production of homogenized-condensed fish.

The United States supply of fish solubles, including homogenized fish, during January-September 1961 totaled 94,000 tons--6,000 tons more than during the same period in 1960. Solubles and homogenized fish manufactured from domestically-caught fish accounted for nearly all of the supply. Only 3 percent of the supply was imported during the first 9 months of 1961.

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MAJOR INDICATORS FOR U. S. FISH MEAL, SOLUBLES, AND OIL, NOVEMBER 15, 1961:

Fish Meal Production and Imports				
Item and Period	1961	1960	1959	1958
	..... (Short Tons)			
Production:				
November	1/	8,725	10,797	9,749
October	14,100	24,455	22,026	11,630
January-October 2/	262,745	242,486	250,218	189,230
Jan.-December Totals	1/	290,137	306,551	248,140
Imports:				
November	1/	6,149	3,673	6,082
October	1/	12,515	3,821	5,899
September	13,941	9,487	9,224	5,079
January-September	159,140	97,333	119,923	79,881
Jan.-December Totals	1/	131,561	132,925	100,352
Fish Solubles Production and Imports				
Item and Period	1961	1960	1959	1958
	..... (Short Tons)			
Production 3/:				
November	1/	3,524	4,628	8,888
October	7,400	7,192	12,487	8,867
January-October	99,000	92,508	155,302	114,984
Jan.-December Totals	1/	98,929	165,359	130,177
Imports:				
November	1/	282	3,089	867
October	1/	-	1,908	2,548
September	263	38	1,732	253
January-September	2,508	2,832	21,213	5,972
Jan.-December Totals	1/	3,174	26,630	14,567
Fish Oil Production and Exports				
Item and Period	1961	1960	1959	1958
	..... (1,000 Gallons)			
Production:				
November	1/	1,202	1,147	1,028
October	1/	3,024	2,176	1,139
January-October 4/	30,320	24,385	21,352	18,555
Jan.-December Totals	1/	27,879	24,978	22,028
Exports:				
November	1/	1,952	813	2,037
October	1/	591	1,911	3,591
September	1,269	1,861	1,129	665
January-September	12,717	14,504	13,929	6,528
Jan.-December Totals	1/	19,155	19,264	12,539

1/Not available, 2/Does not include crab, shrimp, and miscellaneous meals, 3/Includes homogenized fish, 4/Represents over 95 percent of total production.
Note: Data for 1961 are preliminary.



Maine Sardines

MAINE LEGISLATURE EXTENDS SARDINE CANNING SEASON:

The Maine State Legislature has granted the Maine sardine industry (staggered by its shortest pack in 23 years) an additional 5-1/2 months to operate. Without a dissent-

ing vote, the Legislature in a Special Session early in December 1961, authorized canning on a year-around basis until January 1, 1963, when the legal sardine canning season will automatically revert back to an April 15 opening and December 1 closing.

The total pack to December 1 was approximately 679,000 cases against 1,970,000 cases for the 1960 season, and an average of well over 2 million cases for the past 15 years. The last critically short pack which occurred in 1938 totaled 659,000 cases.

Although there was considerable industry opposition to any extension, the legislators agreed with the proponents that canning operations should be continued through the winter to provide much needed employment in coastal towns and to protect the industry's nationwide distribution and consumer purchase patterns.

Opponents based their arguments on conservation and the difficulties of obtaining fish as well as the winterizing and operation of plants on a profitable basis.

Two bills were considered, one to extend the season for a month for 1961 only and the other to permit year-around canning for two years. After a four-hour public hearing, the Committee unanimously voted for the compromise.

No official count is yet available but it is expected that at least a dozen of the industry's 31 plants will operate, with more held in readiness to open if the fish supply is adequate.

During the war years, 1942-46, year-around canning was permitted as an emergency measure and the average winter pack was about 325,000 cases with 550,000 produced in 1955.

However, as the proponents pointed out at the legislative hearing, the methods of finding and taking fish are now much more advanced and they believe that this will assure greater supplies of raw material.

Although no clear-cut explanation of the 1961 shortage of fish has been given, U. S. Bureau of Commercial Fisheries scientists see a possible clue in the fact that there has been a shift in the ocean currents in the Gulf of Maine. They state that this is a common occurrence and usually of a temporary nature that corrects itself in a matter of a few weeks or months.

The scientists have been unable to find any biological reasons and therefore they see no indication that the shortage should continue through 1962. A further optimistic note is that the 1938 shortage was followed by a banner year in 1939 and for 20 years thereafter except for a few minor fluctuations.

There appeared to be plenty of fish offshore all season but they did not come in to areas where they could be taken, which is another reason why the scientists believe it was a matter of distribution rather than of supply.

CANNED STOCKS, NOVEMBER 1, 1961:

Distributors' stocks of Maine sardines totaled 202,000 actual cases on November 1, 1961, a drop of 75,000 cases or 27 percent from the 277,000 cases on hand on November 1, 1960. Stocks held by distributors on July 1, 1961, amounted to 208,000 cases, and on June 1, 1961, totaled 215,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on November 1, 1961, totaled only 221,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), a drop of 1.0 million cases (82 percent) as compared with November 1, 1960. Stocks held by canners on July 1, 1961, totaled 201,000 cases and on June 1, 1961, totaled 294,000 cases.

The low level of current stocks reflects one of the shortest packs of Maine sardines in recent years. The total pack to December 1, 1961, was 679,000 standard cases. In the same period of 1960 the pack was 1,970,000 cases.

At the beginning of the 1961 packing season on April 1, the carryover at the canners' level was about 457,000 standard cases. Adding the pack of 630,000 cases as of November 1, 1961, results in a total supply of 1,087,000 cases as of that date--1,196,000 cases less than the supply of 2,283,000 cases reported on November 1, 1960. The short pack has affected shipments, which amounted to 409,000 cases from April 1-November 1, 1961, as compared to 1,025,000 cases in the same period of 1960.



Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1961, with Comparisons^{1/}

Type	Unit	1961/62 Season		1960/61 Season				1959/60 Season			
		11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60
Distributors	1,000 actual cases	202	208	215	267	233	277	172	197	252	235
Canners	1,000 std. cases ^{2/}	221	201	294	506	1,029	1,258	359	235	397	843

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

The 1961 season opened late and fishing was consistently spotty. The best catches were made in the mid-coastal areas while the season was almost a complete bust in the traditionally active Hancock and Washington County waters and not much better in the western or Portland area.

Canners' inventories of canned Maine sardines were reported at a very low level on December 4, 1961.

* * * * *



North Atlantic Fisheries

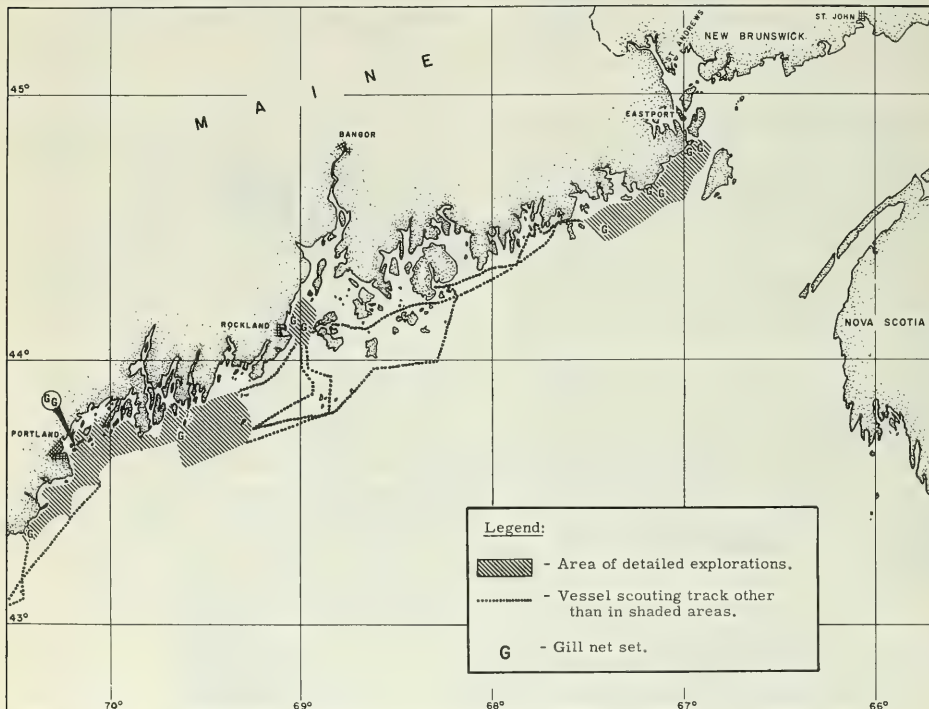
Exploration and Gear Research

COMMERCIAL CONCENTRATIONS OF HERRING SOUGHT OFF NEW ENGLAND COAST:

R/V "T-476" Cruise 61-1, October 9-November 3, 1961: A search for herring along the northern New England coast was conducted with the Bureau's exploratory fishing vessel T-476 during this cruise. The purpose of the cruise was to scout for commercially-usable concentrations of sardines and to report the size and location of any such concentrations found to the sardine industry. The area of explorations extended from Cape Ann, Mass., to Canada. Coastal waters were searched by echo-sounder, by visual watch for surface indications, and by setting gill nets.

Herring were located in several areas. One school was sounded in Grand Manan Channel off Cutler Harbor. However, the fish were in water too deep for conventional fishing methods. Daytime sampling (with vertical gill nets) were unproductive due to the clearness of the water. Subsequent efforts to locate this school of herring at night were unsuccessful. A blind night set (with no fish traces showing on the sounding machine) was made in the area using surface gill nets. Only a few sardines (approximately 6 inches average length) were taken in the set. (It was later learned that this school had been watched for some time by commercial fishermen but had never moved into waters that would permit their being caught.)

Promising evidence of fish were found in the Pleasant Bay area near Ladle Ledge,



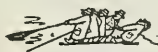
R/V T-476 Cruise 61-1 (October 9-November 3, 1961).

Norton Island, and Flint Island. The fish, as interpreted from tracings on the echosounder, seemed to be in small groups of from 12 to 20 feet in diameter with 200-700 feet between concentrations. Similar, but not as extensive, fish tracings were encountered near Petit Manan Island and the western side of Schoodic Island. This information was relayed to commercial fishermen in the area for possible use should the fish school up.

Scattered midwater fish tracings were found in the vicinity of Isle Au Haut and Martinus Rock. The depth of water was about 55 fathoms; the traces were generally 4 to 14 fathoms below the surface.

Other findings of interest included persistent traces of individual fish or small groups of fish that were found in the vicinity of the eastern end of West Cod Ledge, between Bantam Rock and Damariscove Island whistle buoy, and near Mt. Desert Rock whenever those areas were inspected.

Eleven gill-net sets were made during the cruise. Of that number, 6 sets were made with a vertical-type gill net (set from the surface to 10 fathoms deep) and 5 sets with conventional-type gill nets. Of the conventional gill-net sets, 4 were surface sets and 1 was a bottom set. Species taken included: herring (*Clupea harengus*); bluebacks (*Alosa aestivalis*); whiting (*Merluccius bilinearis*); hake (*Urophycis chuss*); and dogfish (*Squalus acanthias*).



North Atlantic Fisheries Investigations

SEA SCALLOP SPAWNING CHECKED OFF MASSACHUSETTS:

M/V "Charlotte" Cruise 2: In order to check spawning of sea scallops 2 to 5 miles offshore northwest of Sandwich, Mass., the vessel Charlotte, chartered by the U. S. Bureau of Commercial Fisheries, operated in that area on November 14, 1961. A total of six 20-minute tows were made and 250 scallops were measured, sexed and observed for condition of gonads; assorted fish and invertebrates were brought back to the Laboratory.

Two percent of the scallops were unspawned, 18 percent had started, and 80

percent were spent. Water temperature isothermal, about 50.8° F. at 68 feet.

* * * * *

NORTH ATLANTIC GROUND FISH SURVEY COMPLETED:

After completing the second part of an extensive groundfish survey which included sampling the fish populations in the southern New England area, as far south as Hudson Canyon, on Georges Bank and the Great South Channel, the fisheries research vessel M/V Delaware returned to Gloucester, Mass., on November 20, 1961.

The vessel departed from Woods Hole, Mass., on November 8 and fished at selected stations throughout the area. Biological data collected included blood samples from scup, red hake and white hake; age and growth material from haddock, cod, fluke, yellowtail, and whiting; and whiting stomachs. Special collections of young haddock and longfin hake were made for further study in the laboratory. Invertebrates (such as shrimp, starfish, and others) caught at each station were preserved and returned to the laboratory. Hydrographic observations were made throughout the cruise and bottom drift parasols were released at each station.

Note: Also see Commercial Fisheries Review, Dec. 1962 p. 41.



Nutrition

CARDIOLOGIST RECOMMENDS CHANGE IN ARMY DIET:

"Atherosclerosis in the Armed Forces: Should the Military Diet be Altered?" was the subject of a presentation at the annual meeting of the Association of Military Surgeons of the United States on November 8, 1961, by two top medical officers of the U.S. Army.

Col. Weldon J. Walker, Chief, Cardiology Service, Department of Medicine, Walter Reed General Hospital and Consultant in Cardiology to the Surgeon General of the Department of the Army, and Lt. Col. Jacques L. Sherman, Jr., Chief, Medical Research Branch, U. S. Army Medical Research and Development Command, made the presentation which was concluded with the following "Summary and Recommendation":

"Atherosclerosis is a major cause of death and disability among military personnel. The results of population studies show that the standard Army diet is of the type that has been associated with an increased incidence of hypercholesterolemia and atherosclerosis. It is therefore recommended that consideration be given to the feasibility of altering the military diet so that dietary fat does not exceed 35 percent of the total caloric intake, and that a greater proportion of this fat should consist of polyunsaturated fatty acids. Such a change is feasible without impairing the palatability of the diet, and there is no evidence that it would be harmful to anyone. The desirability of the recommended change is supported by the best scientific information available at the present time."

The portion of the paper of most interest to the fishery and allied industries follows:

"...Because of the conflicting data and numerous gaps in our knowledge concerning the relationship of cholesterol and other lipids to atherosclerosis, many have felt that the clinician should avoid attempts to draw prophylactic and therapeutic implications at the present state of our knowledge. However, if we demanded complete knowledge of a disease entity before treating a patient for the disease or attempting to prevent it, most of us would never have practiced medicine. In view of the magnitude of the problem, it would seem imperative to ask if we are not justified in drawing a few tentative conclusions from the data available, so long as these views and conclusions are not potentially harmful to the individual and remain flexible enough to be modified as additional facts become available."

"The Surgeon General in AR-40-564, 9 February 1956, prescribed the basic standards of diet in terms of nutrients for the military ration. In this regulation minimum levels for the physically active soldiers are established for calories, protein, calcium, riboflavin, niacin, vitamin A, and vitamin C. A minimum of 3,600 calories and 100 grams of protein are prescribed for the physically active soldier. No recognition is made of either fat or carbohydrate. Currently the "Joint Army/Air Force Master Menu" is calculated to provide from 4,100 to 4,400 edible calories with the expectation that there will be a kitchen and plate waste of 500 to 800 calories. In addition, Public Law

690 was enacted by the 83rd Congress to provide an increased allowance of dairy products for the Armed Forces diets. In compliance with this law, it has been the policy of the Quartermaster General to allow up to 22 ounces of milk per ration in addition to the milk included in the Master Menu.

"With the above food allowances in effect, it is of interest to know what the soldier actually eats. Recent nutritional surveys accomplished at four Army training camps show that actual total intake is well above the minimum daily recommended allowance. The average total food intake was 4,265 calories with 42.4 percent of the calories being supplied by fat, 45.4 percent by carbohydrates, and 12.2 percent by protein."

"Evaluation of the actual foods consumed showed that of the 210 grams of fat, 41 to 46 percent is saturated, 35 to 40 percent is monounsaturated (mostly as oleic acid), and 15 to 20 percent is made up of polyunsaturated fatty acids. Previously cited population studies have indicated that such diets are associated with a high incidence of atherosclerosis."

"In January, 1961, the Central Committee for Medical and Community Program of the American Heart Association published a report on dietary fat and its relation to heart attacks and strokes. The conclusion of this report states, 'The reduction or control of fat consumption under medical supervision, with reasonable substitution of polyunsaturated for saturated fats, is recommended as a possible means of preventing atherosclerosis and decreasing the risk of heart attacks and strokes. This recommendation is based upon the best scientific information available at the present time.'

"No precise figures exist for the total percentage of calories which should be provided by fat, nor is there established an exact proportion of saturated to unsaturated fat for an ideal diet. There is, however, general agreement among nutritionists who have studied the problem that a diet providing from 25 to 35 percent of total calories from fat is reasonable. It is also generally agreed that substitution of polyunsaturated fat for a substantial part of the saturated fat in the diet is desirable. Total caloric intake should, of course, be adjusted to maintain ideal weight."

"Diets based upon these principles have been used in several metabolic studies which show clearly that abnormal serum lipid levels can be reduced toward normal. More important, such a diet is being used in a study conducted by the New York City Department of Health. The 'Prudent Diet' used in this study restricts the dietary fat intake to 30 percent of total calories with polyunsaturated fatty acids predominating over the saturated fats. There is a reduction in foods such as whole milk, cream, butter, hard cheeses, beef, pork, solid shortening, and chocolate, which are high in saturated fats. In contrast, chicken, turkey and other fowl, fish and shellfish, cottage cheese, cereals, fruits, nuts, and natural vegetable oils are all relatively high in polyunsaturated fatty acids and are therefore recommended.

"This diet has proven to be palatable, inexpensive, and effective in reducing serum cholesterol and beta-lipoprotein levels in persons on normal activities who eat at home under their own supervision. This does not represent a radical change in the American diet. Many of the changes are substitutions: certain margines for butter, skim milk for whole milk, vegetable oils for solid shortenings, sponge and angelfood cake for richer pastries, more fish and fowl, and less beef and pork. Controlled, long-range dietary studies to assess the influence of such dietary changes on longevity is an obvious field for meaningful clinical research."



Salmon

OUTLOOK FOR BRISTOL BAY RED SALMON RUN IN 1962 IS POOR:

The 1962 Bristol Bay, Alaska, red salmon run is expected to drop off from the runs of the past two years, the Alaska Commissioner of Fish and Game announced late in November 1961. The prediction was based on studies by the Alaska Department of Fish and Game, the U. S. Bureau of Commercial Fisheries, and the University of Washington Fisheries Research Institute. All three agencies are participating in coordinated salmon research in the Northwest.

The total Bristol Bay red salmon run (including any Japanese catch made on the high seas) is expected to be between 6 million and 12 million fish, with about 9 million fish con-

sidered a probable total. In 1960 the Bristol Bay red salmon run was 37 million fish and the 1961 run was 18 million fish--the Japanese catch is not included in the totals for both those years.

The Alaska Commissioner stated that in 1962 the expected runs of red salmon to the several Bristol Bay districts (without making allowances for fish the Japanese may catch) are estimated at: Naknek-Kvichak, 6.3 million fish; Nushagak, 900,000 fish; Egegik, 400,000 fish; and Ugashik, 1.7 million fish.

The low predictions are based on several factors, including low escapements in 1957 and 1958 and low out-migrations of young salmon from those escapements. There also appeared to be an unusually high mortality of young salmon which entered the sea in 1959.

The outstanding feature of the 1962 run is the likelihood that the important Nushagak and Egegik district runs will be so poor that there is serious question whether Alaska will feel it advisable to permit the usual type of operation in those fisheries.

It was pointed out that several types of information were used in arriving at the estimates and that variation from the above figures for individual districts can be expected.

The Alaska Commissioner stated that: "Barring any impact whatsoever of the high-seas fishery, the size of the catch in the various districts of Bristol Bay can be expected to range from 'only fair' to 'nothing at all.'"

* * * * *

NEW METHOD OF MARKING FINGERLINGS:

A new method of marking fingerling salmon has been developed by the Seattle Biological Laboratory of the U. S. Bureau of Commercial Fisheries. At the Leavenworth Hatchery food was withheld from approximately 50,000 fingerling sockeye salmon for a period of two weeks. This brief period of starvation resulted in no greater mortality and only 2 percent less growth than in a control group of fish which were fed in the normal way. A distinctive annular ring appeared on scales of 84 percent of the starved fish. Ultimate development of this

new technique, if successful in all its aspects, will permit marking of almost the entire production of a hatchery at very little cost.

* * * * *

RETURNS HIGH AT OREGON STATE HATCHERIES IN FALL OF 1961:

A large number of silver salmon returned to Oregon Fish Commission salmon hatcheries as of November 1961, according to a statement by the Director of Fish Culture.

"We now have on hand enough silver salmon eggs and ripening adults to operate this year's silver-rearing program even if we did not take another fish this season," the Director reported. "Normally November and December are the big months for silver salmon spawning runs." The heavy return of fish to hatchery streams as early as November augurs an exceptionally large run of fish or an unusually early one, he further stated.

At Fall Creek, site of the Fish Commission's Alsea Salmon Hatchery, for example, 1.6 million eggs were reported on hand as of November 3, with another 500,000 expected to be taken from ripening adults in the hatchery's holding pond. This was the largest egg take at the Alsea Hatchery since it began operations in 1952. To that date, 1,200 adult females and 1,100 adult males had been taken at the Fall Creek installation in addition to 3,000 silver jacks. Returns at other stations handling silver salmon were comparable.

The 1958 brood, represented in the current hatchery returns of adult silvers from the ocean, was the first reared under the new feeding program initiated at Fish Commission hatcheries three years ago. Young salmon are started on a "wet" diet composed essentially of finely ground meat and fish products. Research has shown that raw salmon viscera, one of the components of the wet diet, is responsible for transmission of various diseases to the young fish. Under the new program this portion of the diet is now pasteurized, thus eliminating one of the primary causes of hatchery fish mortality. The development of the nutritionally-complete Oregon moist pellet, through the cooperative efforts of the Fish Commission and Oregon State University specialists, has also made a major contribution to the success of the hatchery production program. Silver salmon are fed these pellets from the time they reach $2\frac{1}{2}$ to 3 inches in length until they are

ready for release as yearlings, at which time they usually average from 6 to 7 inches in length.

The superintendent of the Alsea Salmon Hatchery estimated that sportsmen took over 1,000 salmon from the stream below the hatchery prior to its closure on November 1 under provisions of the winter sport fishing regulations. "This is a new sport fishery," he reported. "Prior to this year the silver run was not sufficiently large to attract any appreciable number of anglers."

In a spot check of sport fishermen angling downstream from the Commission's rack on the East Fork of the Millicoma River in Coos County, 24 out of 25 silver salmon examined in a creel check were marked fish reared and released from the Commission's Millicoma salmon-rearing pond.



Shellfish

TWO SANITATION CENTERS TO BE BUILT:

The Secretary of Health, Education and Welfare, announced early in November 1961 that the U. S. Public Health Service will build a shellfish sanitation research center about 30 miles south of Mobile, Ala. This is one of two such installations authorized by Congress in the last session. The site of the other laboratory has been selected adjacent to the Rhode Island University Marine Laboratory. A third laboratory is already in operation on the Pacific Coast at Purdy, Wash.

The Gulf Coast laboratory will be located on the west side of Mobile Bay on Dauphin Island at Indian Mound Park. The Dauphin Island property was presented recently to the Alabama Department of Conservation for use as a public park and as a site for a seafood research facility. The Seafood Division of the Alabama Department of Conservation plans to construct a research building on an adjacent site.

About 25 persons will be employed at the Alabama installation. The new center will be devoted to research and technical assistance in shellfish sanitation, and will be a part of the Federal Government's expanding activities in the field of oceanographic research.



Shrimp

UNITED STATES SHRIMP SUPPLY
INDICATORS AS OF DECEMBER 1, 1961:

Item and Period	1961	1960	1959	1958	1957
..... (1,000 Lbs., Heads-Off)					
Total landings, S. Atl. & Gulf States:					
December	1/	7,097	8,716	8,099	6,718
November	9,100	14,454	12,412	12,416	9,302
October	12,479	21,690	19,602	16,461	14,256
January-November	83,300	133,338	121,943	108,453	109,520
January-December	1/	141,035	130,659	116,552	116,238
Quantity used for canning, Gulf States 2/:					
December	1/	977	1,278	1,943	882
November	1,500	1,614	2,312	3,424	953
October	2,135	2,567	2,631	3,439	1,616
January-November	14,178	27,617	23,401	24,461	17,504
January-December	1/	28,594	24,679	26,404	18,386
Frozen inventory (as of end of each month) -- raw headless only 3/:					
December	1/	40,913	37,886	32,844	21,719
November	1/	37,264	37,334	30,211	22,326
October	17,811	31,209	33,057	24,620	20,362
September	13,361	24,492	26,119	18,079	16,896
January-December monthly avg.	1/	25,954	27,297	18,008	13,627
Imports 4/:					
December	1/	12,411	10,611	10,447	6,865
November	1/	13,516	10,269	10,617	6,789
October	1/	14,211	15,340	11,463	9,237
September	8,629	8,190	7,541	7,620	7,471
January-September	79,175	73,280	70,335	52,866	46,786
January-December	1/	113,418	106,555	95,394	69,576

1/ Not available.

2/ Pounds on headless shrimp determined by multiplying the number of standard cases by 33.

3/ Shrimp products other than raw headless not included.

4/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by U. S. Bureau of Customs.

Notes: Data for 1961 preliminary. November 1961 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

CENTRAL ALASKA CATCHES
OUTSTANDING:

A total of over 3.2 million pounds of shrimp was caught by two shrimp trawlers, operating off Kodiak Island in 1961 (to October 28), according to records of the Alaska Department of Fish and Game. The average catch per trip for one vessel was 75,265 pounds for 23 trips, and the other vessel averaged 68,654 pounds per trip for 22 trips. One trip of 7 days yielded 102,997 pounds, or nearly 8 tons per drag.

Operating out of Seward, Alaska, the two trawlers fished entirely in the Sitkalidka Straits, southeast of Kodiak Island, in 60 to 65 fathoms of water. The average drag was 30 minutes to one hour and each trip was about 1½ days.

The two trawlers are in the 75- to 80-foot class and all trawling was done with 57-foot Gulf of Mexico-type shrimp trawls.

Due to the very small size of the shrimp, expanded production will depend on the solution of processing and marketing problems.



South Atlantic Exploratory

Fishery Program

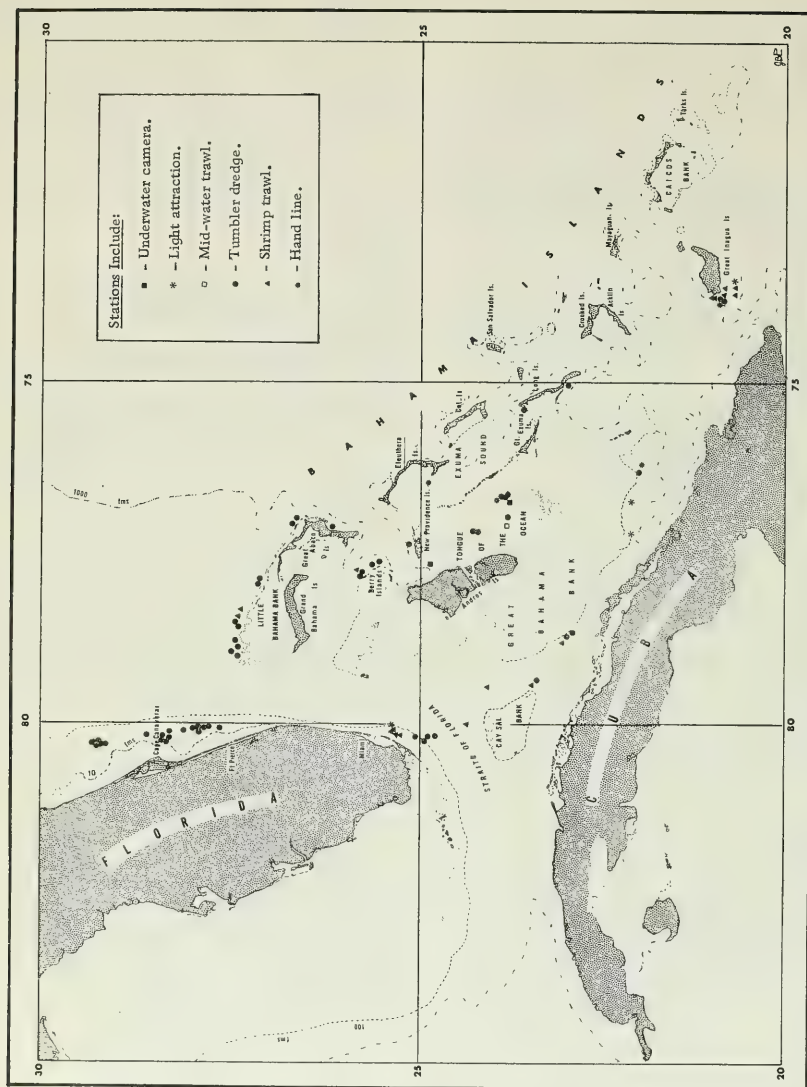
EXPLORATORY FISHING FOR SHRIMP,
SCALLOPS, AND SNAPPERS
IN SOUTH ATLANTIC:

M/V "Silver Bay" Cruise 34 (Oct. 21 - Nov. 13, 1961): A 22-day cruise devoted to shrimp, scallop, and snapper explorations in the Bahama Islands and off the east coast of Florida was completed on November 13, 1961, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Bottom sounding transects, shrimp trawling, and scallop dredging operations were conducted off the north, east, and south edges of the Bahama Islands in order to evaluate that area as a potential source of deep-water shrimp stocks. Explorations were generally restricted to depths outside the Continental Shelf edge (10-35 fathoms) and revealed that rough bottom and precipitous slope conditions predominate over most of the areas surveyed. Bottom trawling and dredging was extremely limited by the topography and only negligible amounts of small noncommercial species of shrimp were encountered.

Difficult and untrawlable bottom conditions were encountered in the following areas: northern and eastern edge of Little Bahama Bank, east of the Berry Islands, eastern edge of the Tongue of the ocean, eastern edge and west of the southern tip of Eleuthera Island, south end of Exuma Sound, eastern edge and west of the southern tip of Long Island, southwest edge of Acklins Island Bank, and southern edge of Great Bahama Bank between Santo Domingo Cay and Mucaras Reef.

Trawling off the western edge of Great Bahama Bank in the Santaren Channel in depths from 200 to 470 fathoms produced catches of Penaeopsis megalops and Cari-



M/V Silver Bay Cruise 34 (Oct. 23, 1961 to Nov. 13, 1961).

dean shrimp. Catches ranged only up to eight pounds. One royal red shrimp (*Hy-menopenaeus robustus*) was taken in 315 fathoms off the northeast edge of Cay Sal Bank. Catches of up to 34 each 31-35 count (heads-off) pink shrimp (*Penaeus duorarum*) were made in 30-60 fathoms off Carysfort Reef, Florida.

A limited number of snapper hand-line stations in depths ranging from 7 to 30 fathoms resulted in uniformly negative results.

Three and a half hours of trolling in the Old Bahama Channel near Guinchos Cay resulted in the capture of about 245 pounds of fish comprised of the following species: great barracuda (*Sphyræna barracuda*) 27 fish; dolphin (*Coryphaena hippurus*) 4 fish; rainbow runner (*Elagatis bipinnulatis*) 2 fish; little tuna (*Euthynnus alletteratus*) 1 fish; and cero (*Scomberomorus regalis*) 1 fish.

Twenty-four dredging stations were occupied on the Cape Canaveral calico scallop bed to provide samples and specimens for Bureau technologists and biologists.



Tuna

UNITED STATES AND TERRITORIES CANNED PACK AT RECORD HIGH:

As of November 18 for the United States west coast, and as of October 31 for Hawaii, American Samoa, and Puerto Rico, the 1961 tuna pack for those areas totaled 13.1 million standard cases--an increase of 800,000 cases or 7 percent as compared with the previous record pack in 1960 for the same period. The pack in the areas mentioned represented over 95 percent of the total pack in the United States and possessions.

While the 1961 California tuna pack through November 18 of 9.6 million cases was slightly ahead of the 1960 pack for the same period, most of the increase was in the pack of tuna in the Islands.

If for the balance of 1961 the rate of tuna packing kept pace with that during the latter part of 1960, the 1961 pack was expected to approximate a record total of 16 million cases.

YELLOWFIN LANDINGS FROM EASTERN PACIFIC:

Yellowfin tuna landings in the United States and Latin American countries in 1961 (through November 15) from the Eastern Pacific totaled a record 104,000 tons as compared with 95,700 tons during the comparable period of 1960, a gain of 9,100 tons or 10 percent.

The 1961 yellowfin landings to date approximate the former record total landings for all of 1960.

NEW CANNERY AT CAMBRIDGE, MD.:

Construction of a modern tuna cannery is now under way at Cambridge, Md., in a large warehouse purchased from a frozen foods corporation. The tuna cannery, a subsidiary of a large West Coast tuna canning firm, is scheduled to be in operation by April 1962.

Japanese-caught Atlantic tuna will be the principal source of raw fish for the cannery. Frozen tuna will be transshipped directly to Cambridge in refrigerated vessels with a carrying capacity of 600 tons.

A large cold-storage plant, included with the cannery purchase, has a capacity for over 5,000 tons of frozen tuna. The firm expects to can about 6,000 tons of raw tuna during the first year of operation. Canning equipment includes 3 high-speed half-pound lines with the latest automatic filling and closing machines.

About 150 local people will be employed in the cannery at the start of the canning operations.

The canned product will carry the same brand name as marketed by the parent company on the West Coast. The Maryland plant's canned tuna pack will be marketed on the Atlantic seaboard which should result in a saving in transportation costs to the consuming areas as compared with shipments from the West Coast.



United States Commercial Fishery Landings, January-September 1961

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1961 and 1960				
Species	Period	1961 ^{1/}	1960	Total 1960
		. . . . (1,000 lbs.)		
Anchovies, Calif. 2/	9 mos.	5,100	2,692	3,804
Cod:				
Maine	8 mos.	1,900	2,437	2,897
Boston 3/ . . .	9 "	15,900	12,052	15,548
Gloucester 3/ . .	9 "	2,100	2,392	3,199
Total cod		19,900	16,881	21,644
Crab, king, Alaska	8 mos.	32,000	20,400	28,570
Haddock:				
Maine	8 mos.	1,900	2,479	3,834
Boston 3/ . . .	9 "	65,200	62,122	76,695
Gloucester	9 "	10,900	9,973	12,107
Total haddock		78,000	74,574	92,636
Halibut 4/:				
Alaska	9 mos.	24,500	20,760	21,351
Wash. & Oreg. . .	9 "	14,100	16,174	16,802
Total halibut		38,600	36,934	38,153
Herring:				
Maine	8 mos.	26,600	105,783	152,327
Alaska	Year	50,000	77,913	77,913
Industrial Fish:				
Me. & Mass. 5/ . .	9 mos.	37,400	39,565	43,733
Mackerel:				
Jack	9 mos.	43,500	50,156	74,945
Pacific	9 "	25,200	19,496	36,808
Menhaden	10 mos.	2,130,100	1,861,186	1,999,000
Ocean Perch:				
Maine	8 "	55,600	54,773	78,258
Boston	9 "	4,900	939	1,481
Gloucester	9 "	46,600	53,550	61,673
Total ocean perch		107,100	109,262	141,412
Salmon, Alaska . . .	Year	262,500	207,101	207,101
Sardines, Calif. . .	to Nov. 11	29,500	47,633	57,513
Scallops, sea, New Bedford (meats) . .	9 mos.	16,000	14,658	19,353
Shrimp (heads-on), South Atlantic & Gulf States	10 mos.	125,600	200,733	236,338
Squid, Calif. 2/ . . .	9 mos.	1,400	64	646
Tuna, Calif.	to Nov. 4	280,900	250,410	283,060
Whiting:				
Maine	8 mos.	13,800	10,723	11,123
Boston	9 "	73	397	754
Gloucester	9 "	43,600	51,617	63,112
Total whiting		57,473	62,737	74,989
Total all above items		3,366,873	3,198,760	3,590,045
Others not listed		555,127	514,282	1,366,755
Grand Total		3,922,000	3,713,042	4,956,800

1/ Preliminary. 2/ Cannery receipts. 3/ Landed weight. 4/ Dressed weight. 5/ Excludes menhaden. Note: The 1960 grand total represents finfish converted to round weight, crustaceans weight in the shell, and mollusks meats only.

Total Landings: Landings of fish and shellfish in the United States during the first 9 months of 1961 were up 209 million pounds, or 6 percent more than during the comparable period of 1960.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch for the year totaled about 262 million pounds--a gain of 55 million pounds over a year ago.

Shrimp: The South Atlantic and Gulf States landings (126 million pounds) were down 75 million pounds--a drop of 37 percent as compared with the same period in 1960.

Menhaden: Landings during the first 10 months of 1961 amounted to 2,130 million pounds--an increase of 269 million pounds over the previous year. It appears that the 1961 catch will exceed the record 1959 landings of 2,203 million pounds.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) totaled about 281 million pounds to November 4, 1961--up 30 million pounds from the same period in 1960.

Haddock: The 9-months 1961 landings of 78 million pounds were 3.4 million pounds greater than during the same period in 1960.

Halibut: The Alaska, Washington, and Oregon catch through September of 38.6 million pounds was 1.7 million pounds more than in the same period in 1960.

Scallops: New Bedford landings of meats during the first 9 months of 1961 of 16 million pounds exceeded 1960 for the same period by 1.3 million pounds.

Mackerel: Landings of Pacific mackerel (25 million pounds) through September 1961 were 6 million pounds more than those in the previous year, while jack mackerel landings (43.5 million pounds) declined 6.7 million pounds.

Whiting: During the first 9 months of 1961, landings at Gloucester (54 million pounds) were down 8 million pounds as compared with the previous year.



U. S. Fishery Landings

NEAR RECORD COMMERCIAL CATCH IS INDICATED FOR 1961:

A near-record United States commercial fisheries catch in 1961 is indicated by data available in November 1961. Preliminary data point toward a total United States catch of over 5 billion pounds of fish and shellfish for the year. The 1960 catch was estimated at 4.9 billion pounds.

The 1961 catch although larger than in 1960, will be less than the record 5.3 billion pounds taken in 1956, but may equal or exceed the second highest catch of 5.1 billion pounds taken in 1959.

Data for the first 9 months in 1961 show an increase of 209 million pounds (about 6 percent) over the same period of last year. Record catches of menhaden, king crabs and possibly sea scallops, are expected. However, landings of herring, sardines, and shrimp will be far below normal. Menhaden landings of 2,130 million pounds in 1961 show an increase of 269 million pounds over the

1960 catch for the same period. One reason for this increase is a stepped-up fishing effort due to the improved market for fish meal, a menhaden product.



Crab fishing vessels docked at Fishermen's Wharf.

The Alaskan catch of salmon for 1961 totaled about 262 million pounds, a gain of 55 million pounds over 1960. Landings of tuna in California, including shipments of fish caught by United States fishing boats operating off South America, totaled about 281 million pounds from January 1 to November 4. This is up over 30 million pounds from 1960.

Shrimp landings in the South Atlantic and Gulf States in 1961 were down 37 percent. Shrimp fishermen in those States had caught 126 million pounds by the end of October, a drop of 75 million pounds. During the first nine months of 1961, landings of whiting at Gloucester Mass., totaled 44 million pounds, down 8 million pounds when compared with the same period for 1960.

Jack mackerel landings also were lower, but Pacific mackerel, halibut, haddock, and scallops were considerably higher than the 1960 catch over the same period.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, SEPTEMBER 1961:

During September 1961, 22 vessels of 5 net tons and over were issued first docu-

ments as fishing craft as compared with 23 in September 1960. The number issued first documents in the first 9 months in 1961 was 6 more than in the same period in 1960.

Table 1 - U. S. Fishing Vessels 1/4--Documentations Issued and Cancelled, by Areas, September 1961 With Comparisons

Area (Home Port)	Sept.		Jan.-Sept.		Total
	1961	1960	1961	1960	1960
..... (Number)					
<u>Issued first documents 2/:</u>					
New England	1	1	27	27	35
Middle Atlantic	2	-	11	15	18
Chesapeake	5	8	47	58	78
South Atlantic	6	1	37	43	47
Gulf	4	7	87	71	90
Pacific	4	6	140	129	146
Great Lakes	-	-	11	13	18
Puerto Rico	-	-	2	-	-
Total	22	23	362	356	432
<u>Removed from documentation 3/:</u>					
New England	2	2	15	19	22
Middle Atlantic	4	1	21	7	18
Chesapeake	1	2	28	15	21
South Atlantic	2	4	20	26	38
Gulf	7	4	77	72	90
Pacific	8	7	70	58	87
Great Lakes	1	1	16	8	13
Puerto Rico	-	-	-	1	1
Total	25	21	245	206	290

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, September 1961

Gross Tonnage	Issued 2/	Cancelled 3/
..... (Number)		
5-9	10	6
10-19	2	9
20-29	5	2
30-39	1	2
40-49	1	-
60-69	1	2
70-79	1	2
150-159	-	1
250-259	1	-
320-329	-	1
Total	22	25

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 16 in 1961, 1 in 1959, 1 in 1953, 3 prior to 1951, and 1 unknown. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, SEPTEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during September 1961 declined 5.9 percent in quantity and 8.7 percent in value as compared with August 1961. The drop was due primarily to smaller imports of all types of frozen fillets, canned tuna and bonito, fresh and frozen salmon, canned sardines not in oil, fresh swordfish from Canada, frozen spiny lobster tails, and sea scallops. Imports were up for frozen tuna, tuna loins and discs, canned salmon, canned sardines in oil, and frozen shrimp.

Compared with September 1960, the imports in September 1961 were down 6.4 percent in quantity but up 1.5 percent in value. The increase in value was due to the higher prices in 1961 for nearly all imported fishery products. The drop in quantity came about because of smaller imports of frozen fillets other than groundfish, frozen tuna other than albacore, canned light meat tuna, fresh and frozen salmon, fresh swordfish from Canada, canned crab meat, frozen and canned lobster and spiny lobster, shrimp, and sea scallops. These declines were not offset by increases in the imports of frozen groundfish fillets, frozen albacore tuna, frozen tuna loins and discs, canned white meat tuna, canned salmon from Japan, canned sardines in oil and not in oil, and sea scallops from Canada.

U. S. Imports and Exports of Edible Fishery Products, September 1961 with Comparisons						
Item	QUANTITY			VALUE		
	Sept.		Year	Sept.		Year
	1961	1960	1960	1961	1960	1960
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed 1/	83.0	88.9	1,011.6	26.3	25.9	304.8
Exports:						
Fish & shellfish:						
Processed only 1/ (excluding fresh & frozen)	1.3	6.3	48.7	0.7	3.4	19.2

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in September 1961 were down 23.5 percent in quantity and 22.2 percent in value as compared with August 1961. Compared with the same month in 1960, the exports in September 1961 were down 79.4 percent in both quantity and value. The lower

exports in September 1961 as compared with the same month in 1960 were due to a drop in the exports of canned shrimp, salmon, and California sardines.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1961:

Imports: The imports of groundfish and ocean perch fillets and blocks during January-September 1961 continued to increase, reaching a new high. The largest single category, blocks and slabs, was up 43 percent as compared to the same period in 1960. Canada, Iceland, Norway, and Denmark, the principal suppliers of blocks and slabs, all showed substantial increases. Fillet imports were up 13 percent in the same period.

Fresh and frozen tuna imports dropped 15 percent; although there was a decline in imports from Japan, Trinidad and West Africa shipments were up. Canned tuna in brine imports increased slightly. A large increase in imports of canned albacore or white meat tuna from Japan was counterbalanced by a decline in canned or light meat tuna.

Table 1 - U. S. Imports of Selected Fishery Products,
January-September 1960 and 1961

Commodity	Jan.-Sept.	
	1961	1960
..... (1,000 Lbs.)		
Groundfish and ocean perch:		
Fillets	58, 246	51, 592
Blocks and slabs	94, 426	65, 807
Total	152, 472	117, 399
Flounder fillets	12, 830	13, 683
Swordfish	14, 067	12, 496
Tuna, fresh or frozen:		
Albacore	48, 909	48, 708
Other than albacore	103, 243	129, 394
Total	152, 152	178, 102
Tuna loins and discs	5, 785	5, 893
Tuna, canned in brine:		
Albacore	22, 265	11, 847
Other than albacore	19, 269	26, 288
Total	41, 534	38, 135
Tuna, canned in oil	344	532
Bonito and yellowtail, canned	8, 004	8, 205
Crab meat, canned	2, 529	3, 129
Shrimp (mostly frozen; some canned or dried)	79, 175	73, 280
Sea scallops, fresh or frozen	6, 858	5, 549
Lobster, fresh or frozen:		
Northern	17, 812	18, 463
Spiny	15, 362	24, 523
Oysters, canned	5, 163	4, 446
Salmon:		
Fresh or frozen	7, 128	7, 936
Canned	5, 206	13, 519
Sardines:		
Canned in oil	17, 960	15, 373
Canned not in oil	9, 355	5, 551
Frog legs	1, 459	1, 965
Fish meal	159, 140 (tons)	97, 333 (tons)
Fish solubles	2, 508 "	2, 832 "

Fresh or frozen shrimp imports were up from all major supplying countries; Mexico supplied well over half of total imports. Fresh or frozen lobster or spiny lobster imports were about the same; but increased shipments came from the South Africa Republic, Brazil, Mexico, and the Bahamas while shipments from Canada (northern lobster), New Zealand, Cuba, and Australia declined.

Canned salmon imports from Japan were down 66 percent, resulting in a sharp drop in total canned salmon imports. Fresh and frozen salmon imports declined about 10 percent owing to reduced shipments from Canada.

Norway and Portugal supplied most of the increase in the imports of canned sardines in oil. Imports of canned sardines not in oil from South Africa were up 69 percent. Imports of canned crab meat (mainly from Japan) decreased about 18 percent; canned oysters increased by about the same percentage. Fresh or frozen scallops, imported principally from Canada, were up 24 percent.

Fish meal imports were up 63 percent. Peru doubled the amount it supplied, which was about twice the amount shipped from all other nations combined. Receipts from South Africa, Angola, and Canada also increased considerably while those from Chile declined. Imports of fish solubles declined by 11 percent. Imports of frog legs showed a 26-percent drop, owing mainly to a reduction in receipts from Cuba.

Exports: Exports of canned sardines during the first 9 months of 1961 were about one-third of the amount for the same period in 1960, due primarily to the sharp decline in sales to the Philippines. However, the Philippines and Ecuador continued to be the two leading foreign markets for canned sardines not in oil, taking over one-fourth of the total quantity exported. Exports of canned mackerel increased by 190 percent.

The United Kingdom took 48 percent of the total canned salmon exports, but the total amount was less than half that sold there during the same period in 1960. Other countries continued to increase their purchases of canned salmon. Exports of fresh or frozen salmon to all countries decreased.

Exports of fresh or frozen shrimp were twice those of the same period in 1960. Ex-

Table 2 - U. S. Exports of Selected Fishery Products, January-September 1960 and 1961

Commodity	Jan.-Sept.	
	1961	1960
	(1,000 Lbs.)	
Fish oils	95,375	107,778
Oysters, shucked	321	334
Salmon:		
Fresh or frozen	750	1,697
Canned	4,743	6,480
Mackerel, canned	2,596	896
Sardines:		
Canned, not in oil	4,463	13,285
Canned, in oil	154	135
Shrimp:		
Frozen	3,602	1,857
Canned	2,009	2,631
Squid, canned	1,109	6,890
Misc. fish, fresh or frozen (mostly fresh-water)	2,287	3,588

ports to Japan accounted for the increase. Canada took 36 percent; Japan, 50 percent.

Exports of canned shrimp were down 24 percent, owing to smaller shipments to Canada and the United Kingdom because of a drop in the pack.

A sharp reduction in canned squid exports has resulted from an unfavorable exchange rate in the Philippines. Exports of squid to Greece also decreased markedly.

Fish oil exports were down 12 percent due to sizable reductions in shipments to Sweden, Netherlands, and West Germany. An increase was reported in shipments to Canada, Norway, and certain other countries, but not enough to overcome the large decline in exports to the principal markets of 1960. Peruvian fish oil was reported to be replacing United States oils in the major markets.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1961 at the 12½-percent rate of duty was 57,114,714 pounds (about 2,720,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports from January 1-October 28, 1961, amounted to 45,545,956 pounds (about 2,168,900 std. cases), according to data compiled by the Bureau of Customs.

Imports in 1960 for the period January 1-October 29 amounted to 41,295,078 pounds (about 1,966,400 std. cases).

Note: Pounds converted to cases at 21 pounds equal 1 std. case of 48 7-oz. cans.

EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN, JANUARY-AUGUST 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably in August 1961. Of the almost 7.0 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 8 months of 1961, almost 4.9 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. Most of the re-exports consisted of shrimp imported into the United States from Mexico.

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp ¹ to Japan, January-August 1961			
Type of Product	July	August	Jan.-Aug.
	(1,000 Lbs.)		
Domestic	1,211	243	1,900
Foreign	1,137	254	2,959
Total	2,348	497	4,859
¹ Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.			

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country has purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

FISHERY IMPORT TRENDS, 1960:

For the first time in 11 years, the value of annual imports of fishery products entering the United States declined. In 1960, the foreign value of imported fishery products totaled \$360,065,000, a decrease of 2 percent from the record high reached in 1959. This value was, however, 82 percent greater than the value of imports in 1950. Edible fishery products were valued at \$307,380,000 and

other fishery products at \$52,685,000. There were declines in both categories.

The United States remained the world's leading importer of fishery products. In 1960, a total of 112 countries shared in the United States market for fishery products. For countries like Japan, fishery products are an important part of their trade with the United States. Mexico earns much of its dollar exchange from its sale of shrimp. Likewise, frozen fish and shellfish in various forms provide considerable dollar exchange for Canada and Iceland.

Trends by Countries: Canada, Japan, and Mexico, the leading suppliers of fishery products to the United States (table 1), accounted for 62 percent of the value of all United States fishery imports. Canada alone provided over 28 percent. Other leading countries in the top ten during 1960 were: Peru, Norway, South Africa Republic, Australia, Iceland, Panama, and Portugal.

Table 1 - Value of U. S. Imports of Fishery Products, by Selected Countries of Origin, 1956-60					
Country	1960	1959	1958	1957	1956
	(US\$1,000)				
Canada	102,878	101,967	107,005	97,404	95,483
Japan	85,256	96,226	84,872	77,202	70,800
Mexico	36,705	32,869	28,005	25,248	27,815
Peru	14,270	16,374	10,907	9,167	7,320
Norway	12,506	16,405	12,087	11,144	13,620
South Africa Rep.	12,030	12,090	9,332	8,554	8,039
Australia	9,839	8,180	7,665	7,766	6,309
Iceland	9,306	10,000	8,775	6,022	6,200
Panama	5,767	6,458	5,852	6,291	4,269
Portugal	5,289	5,452	5,177	5,507	4,907
Ecuador	4,467	4,159	3,510	3,075	2,308
Denmark	4,342	8,239	5,728	3,463	2,887
El Salvador	4,215	1,297	660	60	-
German Fed. Rep.	4,100	1,814	1,805	1,008	1,319
Brazil	3,916	3,002	2,359	2,337	2,976
Cuba	3,901	4,810	5,542	6,282	8,158
Chile	2,630	1,282	2,007	1,130	1,673
Netherlands	2,562	2,628	1,509	2,496	928
India	2,363	2,239	1,547	1,407	1,328
France	2,317	2,230	1,169	1,139	2,273
United Kingdom	1,759	2,388	1,787	1,540	2,033
Angola	267	3,023	2,065	1,046	742
Other	1/29,380	23,368	17,806	18,155	9,510
Total	360,065	366,500	327,171	297,443	281,197
¹ Imports from 90 countries.					
Note: Value at the foreign port of shipment.					

In 1960, annual imports from a number of countries increased, including those from Mexico, Australia, Brazil, Chile, El Salvador, and West Germany. On the other hand, imports were down from Japan, Norway, Peru, Denmark, Panama, Angola, United Kingdom, and Cuba.

Table 2 - Value of U. S. Imports of Fishery Products from Canada, 1960, by Principal Products	
Product	Value US\$1,000
Fresh or frozen:	
Lobster	14,018
Fresh-water fish	11,754
Fish blocks	11,313
Groundfish fillets	10,285
Salmon	6,325
Halibut	5,711
Flounder fillets	5,358
Fresh-water fish fillets	5,671
Other fresh or frozen	11,382
Total fresh and frozen	81,817
Canned lobster	4,382
Fish meal and scrap	3,287
Other fishery products	13,392
Total imports	102,878

Canada: During 1960, Canada was the leading supplier of fishery products to the United States market with products valued at \$102,878,000. This represented a small gain in value over 1959 but still somewhat less than the high reached in 1958. Canada supplies the United States with a wide variety of fishery products. As usual, fresh and frozen fishery products predominated.

Japan: In 1960, the value of fishery imports from Japan was \$85,256,000, about 11 percent less than the 1959 value. Declines in imports of shrimp, salmon, and crab meat contributed to the decrease. Various tuna products continued to be the major part of the trade.

Table 3 - Value of U. S. Imports of Fishery Products from Japan, 1960, by Principal Products	
Product	Value US\$1,000
Fresh or frozen:	
Albacore tuna	9,198
Other tuna	11,289
Shrimp	1,880
Swordfish	5,282
Canned:	
Light-meat tuna in brine	10,462
White-meat tuna in brine	5,975
Salmon	7,116
Crab meat	5,461
Pearls, cultivated	13,627
Other	14,966
Total	85,256

Mexico: Mexico ranked third as a supplier of fishery products to the United States. During 1960, Mexico supplied 55 percent of the total value of fresh or frozen shrimp imported into the United States. Mexican shrimp imports were 13 percent greater in 1960 than during 1959. The value of shrimp imports was nearly 6 times that of all other fishery products received from Mexico; fresh or

frozen shrimp, \$31,285,000; other fishery products, \$5,420,000; total \$36,705,000.

Other Countries: In 1960, the principal products of other leading suppliers were:

Country	Product	Value US\$1,000
South Africa Republic	Frozen spiny lobster	9,767
Australia	Frozen spiny lobster	9,147
Iceland	Groundfish fillets & blocks	7,881
Panama	Shrimp, mostly frozen	5,674
Norway	Canned sardines	5,092
Peru	Fish meal	3,899
Portugal	Canned sardines	2,362
Denmark	Frozen fillets & blocks	1,538

Areas of Origin: During 1960, North American countries continued to be the principal sources of supply for fishery products imported into the United States (table 4). A total value of \$158,202,000, or 44 percent, of the total imports came from North American sources. Asia was the second leading area of supply. Other continental sources ranked as follows: Europe, South America, Africa, and Oceania.

Table 4 - Value of U. S. Imports of Fishery Products by Area of Origin, 1960			
Area	Edible	Other (US\$1,000)	Total
North America	151,513	6,689	158,202
Asia	69,612	22,237	91,849
Europe	38,319	9,475	47,794
South America	19,126	12,104	31,230
Africa	15,123	1,731	16,854
Oceania	13,687	449	14,136
Total	307,380	52,685	360,065

Note: Value at the foreign port of shipment.

Trends by Commodities: For the seventh consecutive year, the value of United States imports of shrimp increased. Fresh and frozen shrimp was the leading item in the import trade (table 5). Other leading products were: fresh or frozen lobster, fresh or frozen groundfish and ocean perch fillets and blocks, frozen tuna, canned tuna, pearls, fish meal, canned sardines, and canned salmon.

Shrimp: The value of shrimp imports increased 8 percent to \$56,380,000 in 1960. This set a new record for this product. Greater shipments were received from Mexico, El Salvador, British Guiana, Colombia, Egypt, and Iran. There were declines in shipments from Japan, Panama, Ecuador, and India.

Table 5 - Value of U. S. Imports of Fishery Products, by Selected Commodities, 1956-60

Commodity	1960	1959	1958	1957	1956
	(US\$1,000)				
Edible Products:					
Fresh or Frozen:					
Shrimp	56,380	52,306	43,162	35,415	32,986
Tuna	31,713	29,728	25,377	16,765	15,337
Groundfish fillets and blocks	33,265	38,759	30,431	27,417	25,987
Lobster	44,794	38,635	35,661	36,827	34,285
Other	61,845	60,940	63,243	55,575	50,663
Total fresh or frozen	227,997	220,368	197,874	171,999	159,258
Canned:					
Tuna	19,142	21,688	16,882	17,002	14,998
Salmon	7,541	11,130	11,271	9,470	11,650
Sardines	9,115	8,370	8,564	8,957	7,110
Crab meat	5,514	7,947	6,116	6,254	5,318
Lobster	5,239	6,441	3,952	5,017	5,031
Other	16,067	17,083	15,561	14,645	13,486
Total canned	62,618	72,659	62,346	61,345	57,593
Other edible products	16,765	18,006	19,992	17,612	16,315
Products other than edible:					
Fish meal	11,068	15,884	11,335	9,717	11,518
Pearls	14,563	13,678	10,944	9,989	8,651
Other	27,054	25,905	24,680	26,781	27,862
Total	52,685	55,467	46,959	46,487	48,031
Grand Total	360,065	366,500	327,171	297,443	281,197

Note: Value at the foreign port of shipment.

Lobster: Northern lobster imports, nearly all from Canada, comprised 37 percent of the total lobster imports; spiny lobster made up 63 percent. Almost half of the spiny lobsters came from South Africa Republic, Cuba, and Australia. In 1960, fresh and frozen lobster imports were valued at \$44,794,000, and canned lobster imports at \$5,239,000.

Fresh or Frozen Groundfish and Ocean Perch Fillets and Blocks: Imports in this category declined from \$38,759,000 in 1959 to \$33,265,000 in 1960. Frozen fish blocks constituted 56 percent of the total. Canada, Iceland, Norway, and Denmark were the major suppliers of imported fillets and blocks.

Tuna: In 1960, the value of frozen tuna imports was \$31,713,000; the value of canned tuna, \$19,142,000. Japan supplied 65 percent of the value of the fresh and frozen tuna and 86 percent of the canned tuna. A significant increase occurred in imports of canned tuna from Spain, Portugal, and Peru.

Fish Meal: Imports during 1960 were valued at \$11,068,000. In order of importance, Peru, Canada, Chile, and South Africa Republic were the principal suppliers. Angola, formerly a leading supplier, had a poor production year.

Table 6 - U. S. Duties Collected on Fishery Imports and Average Ad Valorem Equivalent

Year	Duties Collected US\$1,000	Average Ad Valorem Equivalent Percent
1960	15,857	4.3
1959	17,737	4.8
1958	16,645	5.1
1957	15,955	5.4
1956	15,504	5.5

Duties Collected: Duties collected on fishery products imported by the United States in 1960 were \$15,857,000, or 11 percent lower than the total collected in 1959. The average ad valorem equivalent of the duties collected has continued to decline over the last several years (table 6).

U. S. COMMERCIAL ATTACHES TO PURSUE EXPORT SALES VIGOROUSLY:

Commercial Attaches at U. S. Missions overseas are going to get more and better backing from the Commerce and State Departments than ever before. However, they will be expected to bolster President Kennedy's Export Expansion Program through new, aggressive efforts to increase sales of United States products in the countries to which they are assigned.

This was the principal emphasis at a five-day conference concluded early in December 1961 in London between 22 commercial officers from U. S. Missions in 17 Western European countries and a delegation of top officials from the Commerce and State Departments. As Under Secretary of Commerce Edward Gudeman, leader of the Washington delegation put it:

"We want new ideas from you. That includes criticisms of existing procedures, which aren't producing results or are wasting your time. We're going to try to get things done that you want us to do. I can assure you that we're going to be responsive to your requests as never before."

At the conference were commercial officers representing posts in London, Copenhagen, Reykjavik, Bonn, Madrid, Paris, Oslo, Bern, Brussels, Dublin, Helsinki, The Hague, Vienna, Stockholm, Portugal, Rome, and Belgrade.

The Conference focused its attention on (a) a review of the new responsibilities of

the Commercial officers in promoting the Commerce Department's Expansion Program, (b) details of the Department's new plans and program in the field of international affairs, and (c) the effectiveness of the Department's current services to U. S. businessmen and its export promotion activities.

The new and increasingly important role of the commercial attache in helping to carry out the Department's export expansion drive received special attention in the conference sessions.

Members of the Washington delegation made it clear they are determined to free the commercial attaches from routine tasks to concentrate on making contacts in the business communities of the countries to which they are assigned. This will permit greater opportunity for location of new markets for new products and new ways of selling them. No longer is it sufficient for the commercial officer simply to reply to inquiries from individual businessmen. Instead, the Washington group said, they must take the lead in alerting United States business to new opportunities for sales abroad. In addition, they must be particularly watchful for export opportunities for American businessmen who have never sold in overseas markets before.

The Washington delegation urged the commercial officers to make new and vigorous efforts to help eliminate obstacles to imports of United States products in the countries to which they are assigned. They will be expected to take a "hard sell" approach in behalf of the Commerce Department's export expansion program.



Whaling

U. S. PRODUCTION OF WHALES AND PRODUCTS:

Preliminary 1961 data show that the United States whale catch totaled 316 whales. The whales were taken by 6 whale catcher boats operated by 3 shoreside plants. Two of the plants are at Point San Pablo in San Francisco Bay, Calif., while the third plant is located at Warrenton, Oregon. The Oregon plant started operations in 1961.

The 1961 catch is reported as the best since the rebirth of United States west coast whaling in 1956.

The 1960 total catch of 271 whales was 38 whales, or 12 percent, less than the 1959 catch of 309 whales (see table 1).

Table 1 - U. S. Whale Catch, 1960 and 1959

Species	1960	1959
	Number	Number
Blue	1	5
Bottlenose	2	2
Fin	138	106
Humpback	67	140
Sei	47	39
Spem	16	17
Total	271	309

By species, the catch of humpback whales declined the most, dropping from 140 in 1959 to 67 in 1960, a decrease of 52 percent. The fin whale catch of 138 in 1960 increased 32 whales over the 1959 catch.

The 1960 production of whale meal, oil, and meat totaled 10.3 million pounds, a decrease of 1.1 million pounds as compared with 1959. The 1960 value of those products totaled \$672,000, a decrease of \$203,000 or 23 percent (see table 2). Depressed prices for meal and oil in 1960 accounted for the large decrease in the value of the products.

Table 2 - U. S. Production of Whale Products, 1960 and 1959

Product	1960		1959	
	1,000 Lbs.	US\$1,000	1,000 Lbs.	US\$1,000
Meal	2,973	135	3,763	263
Meat	4,010	362	3,722	347
Oil:				
Spem . . .	170	10	171	12
Whale . .	3,109	165	3,739	253
Total . . .	10,262	672	11,395	875

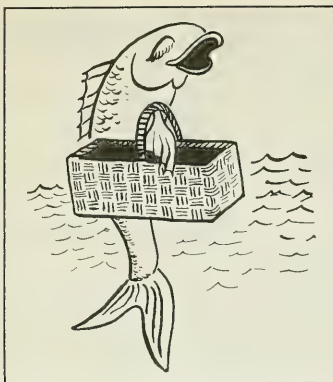
During both 1959 and 1960 only 2 firms in the San Francisco Bay area engaged in whaling in this country. The red meat of whales is ground up and frozen mostly for use as mink feed. Small quantities are used in the canned pet feed industry.



Wholesale Prices, November 1961

Wholesale prices for edible fish and shellfish in November 1961 were up 2.2 percent from the previous month and 7.3 percent higher than in the same month of 1960, according to the wholesale price index for edible fishery products (fresh, frozen, and canned). There was a steady increase in prices April through November 1961 except for a slight dip in September.

Higher prices in November 1961 than the previous month for whitefish and yellow pike at Chicago and New York City, respectively, more than offset the drop of 8.1 percent in the prices of large drawn fresh haddock at Boston. The drawn, dressed, or whole finfish subgroup during that period was up only slightly. November 1961 prices for the subgroup in general were down 7.5 percent as compared with the same month in 1960. But the movement of the individual items in the sub-



group was mixed. Prices were down substantially for fresh drawn haddock at Boston (down 25.7 percent), frozen king salmon at New York City (down 5.5 percent), and yellow pike at New York City because of greater landings. Those lower prices were more than offset by higher prices for frozen dressed halibut at New York City (up 17.3 percent) and whitefish at Chicago.

Among the processed fresh fish and shellfish prices there was very little change from October to November 1961. Oysters became more plentiful as the season progressed and prices were down slightly. Compared to a year earlier, November 1961 prices for the subgroup were 12.1 percent higher. A 26.0-percent rise in fresh large shrimp prices at New York City and a 5.0-percent rise in prices of shucked oysters at Norfolk were responsible. The increases were partly offset by a drop of 17.1 percent in fresh haddock fillet prices at Boston, which followed the same downward trend as fresh drawn haddock.

Processed frozen fish and shellfish prices in November 1961 were up 2.6 percent from the previous month because of a 6.1-percent increase in small haddock fillet prices at Boston and an increase of 1.7 percent in frozen shrimp prices at Chicago. Compared with a year earlier, the increase for the subgroup was 12.0 percent because of lower supplies of frozen shrimp, and haddock and ocean perch fillets caused the prices of those products to rise. However, in that period there was a slight drop in flounder fillet prices.

Canned fishery products prices in November 1961 were up 4.0 percent from the previous month and 10.6 percent from a year earlier. All items in the subgroup were priced substantially higher than a year earlier--canned tuna up 9.5 percent, canned Maine sardines up 44.8 percent, canned California sardines up 27.4 percent, and canned salmon up 9.5 percent. Demand for all canned fishery products has remained steady and in the case of tuna has increased. The 1961 packs of canned tuna and salmon were higher than the previous year, but the packs of California sardines and Maine sardines were down critically.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ¹ / _(%)		Indexes (1947-49=100)			
			Nov. 1961	Oct. 1961	Nov. 1961	Oct. 1961	Sept. 1961	Nov. 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					141.1	138.1	136.9	131.5
Fresh & Frozen Fishery Products:					154.6	153.0	151.4	146.9
Drawn, Dressed, or Whole Finfish:					163.0	162.5	160.0	165.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.11	98.5	107.2	95.2	132.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.35	108.3	107.3	120.7	92.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.85	.85	191.0	191.0	188.2	202.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.83	.69	204.6	171.1	130.2	185.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.48	.45	111.4	105.5	140.7	164.1
Processed, Fresh (Fish & Shellfish):					158.8	158.6	155.7	141.7
Filletts, haddock, sml., skin on, 20-lb. tins	Boston	lb.	.34	.32	115.7	108.9	105.5	139.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.88	.87	138.3	136.7	140.6	109.8
Oysters, shucked, standards	Norfolk	gal.	7.88	8.00	194.9	198.0	185.6	185.6
Processed, Frozen (Fish & Shellfish):					133.9	130.5	130.9	119.6
Filletts: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	103.4
Haddock, sml., skin on, 20-lb. pkg.	Boston	lb.	.35	.33	109.9	103.6	103.6	106.7
Ocean perch, lge., skin on 1-lb. pkg.	Boston	lb.	.30	.30	120.8	120.8	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.90	.88	138.1	135.8	136.6	114.2
Canned Fishery Products:					121.8	117.1	116.4	110.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	11.65	87.6	84.0	82.9	80.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.90	4.90	114.4	114.4	110.9	89.8
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	10.31	131.0	109.7	109.7	90.5

¹/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



FOREIGN

International

NORTH PACIFIC FISHERIES COMMISSION

COMMISSION MEETING IN JAPAN REVIEWS INTERNATIONAL SALMON RESEARCH:

Biological evidence upon which management of salmon resources of two continents may eventually be based was reviewed by the International North Pacific Fisheries Commission at a meeting in Tokyo, Japan. The sessions began with technical meetings on October 23, 1961, and continued through November 11.

Japan, which harvests salmon on the high seas, and the United States and Canada, which harvest the salmon as they head for the spawning streams, are signatories of the treaty creating the Commission. This treaty became effective in 1953. It provides for comprehensive biological studies of the North Pacific Ocean, particularly the distribution of salmon through that area.

Two stocks of salmon intermingle on the high seas: those which spawn in North American streams and those which spawn in Asian streams. Since the species are the same, a major task for the Commission, and one which called for several years of biological research, was the development of means by which the North American salmon could be differentiated from those of Asian origin. This differentiation is accomplished by serological methods, body measurements, scale inspection, and other means. Distribution studies are being made by exploratory fishing for salmon at 60-mile intervals along a grid covering vast areas of the North Pacific Ocean and Bering Sea. More intensive explorations are made when conditions warrant. The U. S. Bureau of Commercial Fisheries was responsible for the major portion of the biological investigations.

As in previous meetings, reviews of the latest presentations of "evidence for abstinence" were high on the agenda of the Tokyo meeting. Under the present treaty, Japan abstains from fishing for salmon east of 175 degrees west longitude, leaving the salmon resources east of that line to Canada and the United States. This principle of "abstinence" is relatively new in international law and its application is considered valid only when a fishery resource is being managed in such a way that the annual harvest is the maximum amount consistent with continuing the resource.

The Commission and the fishery scientists are interested in any study related to any intermingling of North American and Asian salmon and the relationship of any such intermingling to the abstinence line. American and Canadian scientists are particularly concerned whether the harvesting of fish in the area of intermingling has an appreciable adverse effect on the numbers of salmon reaching the North American fishing areas.

Because of the size of the ocean and the many facets of the investigative programs, there is no indication yet as to when the biological data will be sufficiently conclusive to be acceptable to all concerned.

Closing Comments by Chairman of United States Section:
At the final Plenary Session of the Commission on November 11, 1961, the Chairman of the United States Section made these closing remarks:

"... Our scientists have worked long and well. Their accomplishments have been outstanding. They have done a good job.

"We Commissioners have been faced at this meeting with several problems of critical importance to the North Pacific fisheries. Two of them have been with us for some time. One is new. All are admittedly difficult to solve. How have we dealt with them? Let us review the results of this meeting.

"The Secretary of the Interior of the United States, at our opening session, drew our attention to the problem of the critically small Bristol Bay red salmon run in 1962. The run is expected to be one of the smallest in recent years. United States scientists estimate it at about 9 million fish. If adequate escapement to the spawning grounds is to be obtained, severe restrictions will be necessary. The State of Alaska plans to impose the needed regulations on the United States fishery; and in some areas it is possible that complete closure will be necessary. Under the best of circumstances, the American catch will be small. But the success of the severe conservation regime to be imposed upon the inshore fishery and the likelihood of even a minimum economic American fishery will be jeopardized if the high-seas fishery follows a pattern similar to those of 1960 and 1961. Is it not reasonable to expect that the high-seas fishery be similarly restrained? Indeed, restrictions of the utmost severity on the high seas fishery are essential if a disastrous situation is to be avoided.

"What has the Commission done about this problem? It has reaffirmed the resolution on conservation which it adopted at an earlier meeting, and has added certain meaningful phrases to it, drawing attention to the problem. This last is encouraging. The new language suggests, at least, that the 1962 season will be a difficult one. But does this resolution, with the new language, really reflect the critical nature of the problem? We think not, Mr. Chairman. The United States Section has agreed to this general resolution because something is perhaps better than nothing; because we hope that the Governments will read in it what we have been unable to agree to say in it—that a severe conservation regime must be imposed on all fisheries harvesting this run. I wonder how this general resolution will be received by the people of Alaska and the Pacific Coast of the United States whose livelihoods are dependent upon the present and continued productivity of the Bristol Bay run.

"Mr. Udall also spoke of the tremendous growth of bottom fish operations in the Bering Sea and of the threat they would offer to the halibut resource of the eastern Pacific Ocean if they were to be extended into waters south of the Aleutian Islands. He urged us to take cognizance of the problem, to recognize the need for restraint, and to make appropriate recommendations to the Governments. What have we done? We have talked about the problem; exchanged views at length. Beyond this we have done little.

International (Contd.):

"There is reason to fear that the Bering Sea bottom fish operations may expand to the south. Threats of this were heard, I may say, before we came to Tokyo. There is also good reason to believe--we have made some study of the matter, study which is continuing--that if trawlers operate in the waters south and east of the Aleutian Islands on the continental shelf they will catch halibut in substantial quantities, and that they will kill halibut in substantial quantities. The catches may be small in relation to the total catch of other less important species, but, Mr. Chairman, the total catch from Japanese trawling operations alone in the Bering Sea is reported to be in excess of one billion pounds. If the catch to the south is only a fraction of this, the incidental catch and destruction of halibut may be expected to be substantial. We doubt that this would be in accord with the spirit and intent of the Convention.

"As I said, the United States and Canada are conducting an extensive joint study of the distribution of halibut in relation to the distribution of other bottom fish in the waters south and east of the Aleutian Islands. At this meeting we have urged the Commission to recommend to the Governments that the expansion of bottom fish operations to this area be delayed until this study has progressed further; and until we are in a position to evaluate the effect of trawl operations upon the halibut resource. This is a minimum of action. This is only prudent. The Commission has not adopted such a recommendation. Indeed, the Commission can hardly be said to have recognized the critical nature of the problem. Is this responsible action on the part of a Commission charged with the conservation of North Pacific fishery resources?

"The Commission has made somewhat more progress in other fields. We in the United States have for some time been concerned over the fact that the Commission's scientists have not been able to make full use of the statistical and biological data being obtained in the Japanese salmon fleets. We have considered that these data would make a major contribution to the Commission's studies related to the Protocol. Some data have been made available in the past, but they have constituted only a small part of what is needed in that connection. We are gratified to learn that Japan will be able to supply more information in the future as a routine matter. We are disappointed to learn, however, that these data will be grouped in such large geographic units and in such long time periods as to reduce materially their usefulness. We believe that all members of the Commission have an obligation to furnish pertinent information in the most useful form practicable. We earnestly hope that Japan will find it possible to supply data in greater detail as time goes on.

"The record of this meeting--in the light of the critical problems requiring attention and resolution--is not one to be especially proud of, Mr. Chairman. At our opening session I expressed the confidence of the United States that the Commission's deliberations at this meeting would demonstrate it to be worthy of the trust reposed in it by our Governments and our peoples. I am frank to say that that confidence has been shaken--not destroyed, but certainly shaken.

"We hope, we believe that upon reflection all of us--and our Governments--will recognize the critical nature of these problems, and, in the months immediately ahead, give further thoughtful consideration to them. . . ."

* * * * *

INTERIOR SECRETARY UDALL ADDRESSED NATIONAL MEETING IN TOKYO:

The Eighth Annual Meeting of the International North Pacific Fisheries Commission began in Tokyo, Japan, with

technical meetings on October 23 and continued through November 11, 1961. At the opening plenary session on November 6, U. S. Secretary of the Interior Stewart L. Udall addressed the meeting as follows:

"I want to thank Minister Kono for his warm words of welcome and the people of Japan for the most gracious hospitality extended to Mrs. Udall and me during our stay in your beautiful country. In our brief visit we have established friendships that will deepen with the passing of time, and we look forward to a renewal of the valuable contacts which have given us such new insight into the resource development opportunities and problems of the Japanese people.

"My prime responsibility as a Cabinet Officer of the United States Government lies in concern over the conservation and wise use of natural resources. The conservation philosophy of President Kennedy and his administration is an enlargement of the philosophy of a great American of this century who was also a great friend of the Japanese people--President Theodore Roosevelt.

"The very essence of the conservation thinking of these two Presidents is that the welfare of future generations should have a paramount place in resource planning. Indeed, I believe I can state flatly that all three of the Governments represented here today would reject out of hand any proposal that today's standard of living be enhanced at the expense of those who must look to our common resources for sustenance tomorrow.

"This is a conservation conference--and the treaty document that has brought us to this table represents a search for sound principles with which to manage important living resources of the sea. It is the hope of my Government that these deliberations will serve to advance the solution of the complex problems we confront.

"The rapid growth of world populations is creating a steadily increasing demand for food; and the expansion of fishing into all areas of the world, with rapid development of fishing technology, poses a special challenge to fishing nations to cooperate in renewing our world fishery resources. Therefore, it is vital that our fishery conservation commissions make a strenuous attempt to develop facts and scientific data which will enable us to build the foundations of a lasting program.

"Bearing in mind the complex problems which confront us in the North Pacific, my country takes considerable satisfaction in the progress we have made. While some of the terms of the Convention may need clarification to resolve problems which have developed, the United States does consider that thus far the agreement has provided a workable basis for dealing with most of the varied fishery problems in the North Pacific Ocean. We are confident it will become more effective as the Commission enlarges its knowledge of the important stocks of fish in the area, and develops techniques which will give adequate protection to the legitimate interests of the parties to the Convention.

"In many respects the work of this Commission has reflected great credit on those at the conference table today. Your scientific fact-finding investigations have been outstanding. Due to your work the distribution and movements of salmon in the North Pacific--which could only be guessed at ten years ago--are now in large measure defined. You can take pride in the advances in knowledge resulting from your work.

"However, Mr. Chairman, research is a means to an end, not an end in itself. The knowledge which you have obtained must now be applied to the pressing problems which confront you.

"Let me touch briefly upon a few of them.

"Your scientific studies have shown beyond doubt that the red salmon which spawn in the Bristol Bay area of Alaska migrate widely in the North Pacific Ocean. They inter-

International (Contd.):

mingling there with salmon from Asian streams. Because of these circumstances they have become subject to a Japanese fishery. Later, as they approach the spawning streams, these salmon enter the severely regulated United States fishery in the territorial waters of Alaska. This intermingling creates a critical problem—one foreseen in the Protocol to the Convention. Your attempts to solve this problem equitably have been hampered by divergent interpretations of the Protocol. I am confident that in the end you will work out a wise and equitable solution. But, in the meantime, some measures must be taken to meet the immediate problem. In 1962 the situation will be especially critical. The runs are expected to be only a fraction of the runs of 1960 and 1961. It will be difficult to assure that adequate fish reach their spawning grounds so that this fishery upon which the Bristol Bay region of Alaska is so dependent will be maintained. Clearly, restraint is called for. This is a prime consideration of my Government and I must candidly express our concern over it.

"Mr. Chairman, your Commission faces a new and serious problem. Substantial bottomfish operations are already under way in the Bering Sea. If these operations expand into waters to the south, they will jeopardize the conservation of the halibut resources of the eastern North Pacific Ocean. While it is perhaps not the responsibility of this Commission to seek a final solution to this problem, the Commission must, in our judgment, consider what can be done within the scope of its powers to insure the future of this resource. It seems appropriate that the Commission take cognizance of the problem, recognize the need for restraint, and make appropriate recommendations to our Government.

"These examples, Mr. Chairman, serve to illustrate the problems which we face together in the North Pacific. Cooperation, patience, and sympathetic consideration of each other's interests are needed.

"The challenge before us is a part of the much larger problem facing mankind today—how to utilize the food resources of our globe for the betterment of all. Specifically the challenge is first to manage our highly valued fisheries so as to make them produce for us today. Secondly we must establish principles of sound management for the long run so that our peoples will continue to enjoy the fruits of these fisheries in the future."

NORTHWEST PACIFIC FISHERIES COMMISSION

SOVIET-JAPANESE FISHERY MEETING IN MOSCOW:

The Northwest Pacific Fisheries Commission Science and Technology Subcommittee scheduled a technical meeting of fishery experts to be held in Moscow beginning November 27, 1961. The condition of the salmon, crab, and herring resources in the northwest Pacific area will be discussed.

The Japanese delegates to the meeting were announced in mid-November. The Japanese Fishery Agency was planning to send its Production Division Chief and Laboratory Director of the Inland Sea Regional Fisheries Research Laboratory to the meeting. In addition, a number of industry representatives were designated as delegates to the meeting.

The Japanese fishery experts will negotiate with Russian fishery experts on the preservation and catches of salmon in the North Pacific. These negotiations are designed to lay the groundwork for the annual Soviet-Japan fishery talks scheduled to take place in Moscow in February 1962 to establish salmon catch quotas for the North Pacific. The purpose of the preliminary discussions is to shorten the period of negotiations at the Sixth Annual Meeting of the Commission. (Shin Suisan Shimbun Sokuho, November 14, 1961; United States Embassy, Tokyo, report of November 17, 1961.)

FOOD AND AGRICULTURE ORGANIZATION

COUNCIL AND CONFERENCE MEETINGS:

The world food situation and ways to improve it were discussed when the Council and Conference of the Food Agriculture Organization of the United Nations met.



The Conference of FAO, which meets every second year, held its 11th session to review the work of the past two years and to approve the program and set the budget for the organization's 1962/63 biennium. It met November 4-23, 1961. Deliberations were preceded by an October 30 to November 3 session of the Council, the body which governs FAO between Conference sessions, and by meetings from October 30 to November 10 of the Conference's own technical committees on the specific technical activities included in the over-all program of work.

The Council supervises the work of the FAO, reviews the world food and agriculture situation, and makes recommendations to member governments and other international bodies on measures to improve the food and agriculture organization.

Behind the delegates' discussions on particular subjects was the broad picture of the world food and agricultural situation. The FAO annual report, "The State of Food and Agriculture, 1961," showed that after a succession of two or three good years when food production had moved ahead of population, the increase in production in 1960/61 had been less than the increase in the number of mouths to be fed. Indications are that the production rise in 1961/62 might not be much greater. A statement containing more up-to-

International (Contd.):

date information on recent crop developments was presented to the Conference.

The Conference is the chief legislative body of the FAO and normally meets biennially. The chief aims of the Organization, as expressed through the Conference, are to raise levels of nutrition and standards of living, secure improvements in the efficiency of the production and distribution of all food and agricultural products, and better the condition of rural populations. Its membership consists of 82 nations.

MARINE OILS

ESTIMATED WORLD PRODUCTION, 1956-62;

Since 1950, there has been a steady increase in the world production of marine oils (including whale and sperm whale oils and fish and fish liver oils).

Estimated World Production of Marine Oils ^{1/} , Average 1950-54, Annual 1956-62							
1962 ^{2/}	1961 ^{3/}	1960	1959	1958	1957	1956	Average 1950-54
..... (1,000 Short Tons)							
1,265	1,250	1,110	1,120	1,085	1,035	1,110	990
1/Whale, sperm whale, fish, and fish-liver oils.							
2/Forecast.							
3/Partly forecast.							
Source: Excerpted from <u>Fats and Oils Situation</u> , November 1961, FOS-210, Economic Research Service, U. S. Department of Agriculture, Washington, D. C.							

The 1962 production is forecast as slightly greater than in 1961, which in turn is expected to be 140 short tons more than in 1960.

WHALING

NO AGREEMENT ON DISTRIBUTION OF ANTARCTIC WHALE CATCH:

Member countries of the International Whaling Commission have been unable to agree on the distribution of the Antarctic whale catch for the 1961/62 season. The Commission sets the total catch quota, but the participating countries (the U.S.S.R., Japan, Norway, the Netherlands, and the United Kingdom) are responsible for devising a formula to divide the quota. A scheduled meeting of the whaling nations was cancelled when the U.S.S.R. did not respond to invitations from Japan and the United Kingdom. (U. S. Embassy, Tokyo, September 1, 1961.)

NORWEGIAN EXPEDITIONS OFF TO ANTARCTIC GROUNDS:

All of the Norwegian whaling expeditions, which include 7 factory vessels and 71 catchers, early in November 1961 sailed for the Antarctic, where the 1961/62 pelagic season started December 12. The total Norwegian quota, decided by the Government, is 5,100 so-called blue-whale units. Last season, Norway had 8 expeditions, which were assigned a quota of 5,800 units. However, 700 units were lost when the Kosmos III fleet was sold to Japan. Norway will operate with one more catcher than the same fleets operated in the 1960/61 season. Also the current season opened 16 days earlier than the previous season.

This season, about 4,630 Norwegians will man Norwegian and British expeditions in the Antarctic, as against 5,377 in 1960/61 and 6,152 in 1959/60. Altogether 3,515 work aboard Norwegian whaling vessels as against 3,985 last season. But, despite the reduction in crews, whaling companies have had a hard time manning their ships. With plenty of job opportunities at home, Norwegians are less attracted by far-off Antarctic.

Norwegian expeditions which participated in the 1960/61 Antarctic whaling produced 124,246 metric tons of whale oil as against 109,834 tons in 1959/60. The Norwegian whale oil production was valued at about Kr. 180 million (US\$25.2 million), plus about Kr. 20 million (US\$2.8 million) for byproducts from processing plants in Norway. (News of Norway, November 9, 1961.)

OCEANOGRAPHY

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION ADOPTS RESOLUTION:

UNESCO's Intergovernmental Oceanographic Commission at its organizational meeting in Paris, October 19-27, 1961, gave fisheries a good deal of attention.

The Commission adopted a resolution which stated in part "... that oceanographic and fishery research are complementary undertakings and that the Food and Agriculture Organization of the United Nations has the primary responsibility within the United Nations family for fisheries;" and further "... that the Food and Agriculture Organization plans to consider at its forthcoming Conference the establishment of an Advisory Committee on Marine Resources Research."

International (Contd.):

The Intergovernmental Oceanographic Commission, established by the U. N. to promote scientific oceanographic cooperation and to work for the exchange of oceanographic data on a world-wide basis, had some 39 nations in attendance at its first meeting.

The Commission officially requested its members to submit views at its meeting next year in regard to establishing advisory channels in the field of oceanography, including fishery matters.



Australia

AUSTRALIAN FIRM OFFERS TO SELL FISH CANNERIES TO JAPANESE:

An Australian company early in November 1961 approached the Japanese Overseas Fisheries Cooperative with an offer to sell two fish canneries in Australia to Japan. Of the two canneries offered for sale, one cannery with an annual processing capacity of 1,000 metric tons of fish (salmon trout, tuna, and sardines) is located in Melbourne. The other cannery is located on the east coast between Victoria and New South Wales. This plant can process 2,000 metric tons of fish annually.

The sale of the plants would be subject to certain conditions. For example, the purchaser must employ Australian nationals in the canneries. The two canneries now primarily pack sardines and salmon trout. (*Suisan Keizai Shimbun*, November 3, 1961.)



Canada

BRITISH COLUMBIA HERRING FLEET TIED-UP IN EX-VESSEL PRICE DISPUTE:

The British Columbia herring fishing fleet of 78 purse seiners (operated by reduction plants) has been tied up since October 16, 1961, in an ex-vessel price dispute. But about 15 purse seiners operated by a fishermen's cooperative do not bargain for herring prices and were reported fishing as of mid-November 1961.

The fishermen's union officials at Vancouver, B. C., were asking \$13.00 per ton for reduction herring, an increase of 48 percent above the previous price of \$8.80 per ton. The plant operators countered with an offer of \$9.60 per ton, on the basis that this price represents the current

market price improvement over the 1960 ex-vessel price of \$8.80 per ton.

At a meeting between the price negotiators on October 19, a fishermen's union officer announced that the union membership had rejected the plant operators' price offer of \$9.60 as well as the other proposals. As of the end of October, no further meetings had been scheduled, and according to industry sources the tie-up could last all winter.

The current herring fleet price dispute tie-up is the sixth in nine years, reported as follows: 1952/53 - entire fall and winter season; 1955 - start of season to November 5; 1956 - start of season to December 2; 1957/58 - entire fall and winter season; 1959 - May 1 to October 7; and 1961 - October 16 to ?.

During the period of 1952 to date, British Columbia herring fish meal (generally consists of 70 percent protein) prices have fluctuated widely, from a high of \$2.30 per unit of protein to a low of \$1.30 late in 1960. This includes a range of \$161 to \$91 per ton of herring meal, nearly all downward. As of October 18, the British Columbia herring meal price was \$1.85 per protein unit or \$129.50 per ton, U. S. funds, in paper bags, f.o.b. Vancouver, B. C.

Herring oil has also shown a sharp downward price trend in recent years, from 9.75 cents per pound in the 1956/57 season to a September 1961 low of 6 cents per pound, or a decrease of 33.75 cents per Imperial gallon. It was reported that 60 cars of British Columbia herring oil were sold in the week of September 18 at 6 cents a pound. This very low price on British Columbia herring oil was the result of heavy production of fish and marine oils throughout the world. Icelandic herring oil was being landed in eastern Canada at low prices and the Fisheries Association of British Columbia understood approximately 4,000 tons were sold in Toronto, normally a good market for British Columbia herring oil. In order not to lose the market completely to Iceland, British Columbia producers were forced to reduce their prices to the competitive level of 6 cents per pound f.o.b. Vancouver.

The other demands of the union were: (1) a one-year contract; (2) seine boat operation only (if packers are used a separate agreement must be negotiated); (3) \$16 a ton for herring used for canning, salting, etc. (no change in this price from previous agreement). The plant owners, on the other hand, in addition to the price proposal asked for: (1) a three-week Christmas holiday instead of four weeks; (2) fishing crews wishing to use scows or barges should be permitted to do so where such equipment is available; (3) there be some clarification as to the responsibilities of both parties in the preparation, use, and care of herring seines.

The herring fleet had been receiving \$13.00 per ton in 1959, but in November 1960, eleven months after a sharp decline in world herring oil prices had forced the closure of reduction plants, the Union agreed to resumption of fishing at the current price of \$8.80 per ton.

Note: Ex-vessel prices paid in British Columbia are not comparable to those paid in the United States since it is believed that plants own the vessels and gear and may provide for some of the expenses.

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BRITISH COLUMBIA HERRING FLEET PRICE AGREEMENT:

An agreement on the fishermen's price for herring delivered to reduction plants of \$10.40 per ton was reached on November 21, 1961, between herring purse-seine fleet fishermen and reduction plant operators in British Columbia. This is an increase of \$1.60 per ton or 18 percent more than the previous price of \$8.80 per ton, paid prior to the fleet

Canada (Contd.):

tie-up on October 16. At that time the fishermen had asked for a price of \$13.00 per ton, and the reduction plant operators countered with an offer of \$9.60 per ton. The agreement ended a 36-day price dispute tie-up (started on October 16, 1961) for most of the British Columbia herring fleet.

The fishermen's price paid for reduction herring is not comparable with United States ex-vessel prices, since the British Columbia plant operators own the vessels and gear and provide for most of the operating expenses.

The price paid British Columbia fishermen for herring to be made into fish meal and oil is divided equally between all crew members (usually 8 persons) including the captain, on a per-ton basis. The only deduction made is for food. In addition to the fishermen's price, the reduction plant operators pay the captains a bonus equivalent to one crew share or \$1.30 per ton, based on the price of \$10.40 per ton.

The landed or ex-vessel price of British Columbia reduction herring after the recent increase was reported between \$20-\$21 per ton which would be comparable with United States ex-vessel reduction fish prices.

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**BRITISH COLUMBIA DOGFISH LIVER
SUBSIDY TERMINATED
NOVEMBER 6, 1961:**

The Canadian Department of Fisheries has announced that the British Columbia dogfish liver subsidy of 12 cents per pound was terminated on November 6, 1961. The announcement stated that the \$150,000 earmarked by the Government to cover the subsidy program for the fiscal year ending March 31, 1962, had been used up by November 6.

Fishermen were reported asking the Department for an additional \$150,000 allotment for the continuation of the subsidy program until March 31, 1962. The Department in Ottawa was reportedly giving consideration to a possible modified dogfish program if additional funds are made available.

At the end of the previous fiscal year (ending March 31, 1961), 990,169 pounds of dogfish livers were landed in British Columbia,

but fishing for dogfish under the subsidy allotment of \$150,000 did not begin until October 1960 that fiscal year. On the other hand, the subsidy allotment for the 1961/62 fiscal year was made early in the year and fishing for dogfish started early in the year.

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**BRITISH COLUMBIA WHALING INDUSTRY
TO RESUME IN APRIL 1962:**

After a two-year closure, Canada's British Columbia whaling industry will be resumed in April 1962.

The decision to resume whaling, which was shut down in 1959 because of high cost of operations and poor world prices for meal and oil, resulted from a merger of a Japanese and British Columbia firm. Under the partnership formed, the whale meat will be processed for human consumption and shipped to Japan. It is also expected that by-products will be sold in North America for mink and pet food. Previously, the whale meat was processed into meal and oil which was unprofitable.

The new Canadian-Japanese operation is expected to produce \$1.5 million per year in the form of jobs, sales, and secondary effects on other enterprises. A total of 170 jobs will be created with 70 on the tenders and 100 shoreworkers. (United States Consulate, Vancouver, November 1, 1961.)

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**NEW BRUNSWICK FISH MEAL PRICES,
OCTOBER 1961:**

Fish-meal prices (60-percent protein) quoted by New Brunswick producers late in October 1961 averaged about C\$120 a short ton (\$2.00 a protein unit) for both exports and domestic sales. The price has remained the same since late July 1961.

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**FISHERMEN'S COOPERATIVE
ASSOCIATIONS:**

On July 31, 1960, there were 80 fishermen's cooperative associations in Canada, compared with 77 on July 31, 1959. Since the latter date, membership declined from 12,000 to about 10,000. The value of fishery products marketed through the cooperatives exceeded \$20 million during the 1960 season, down about \$1 million from the previous sea-

Canada (Contd.):

son. Total assets rose from \$11.6 million to \$12.3 million. The associations' liabilities to the public increased from \$5.1 million in 1959 to \$6.3 million in 1960. However, liabilities to members declined from \$3.3 million to \$2.6 million during the same period.

Quebec, with 28, reported the largest number of fishery cooperatives. British Columbia led in value of catch with \$6.2 million.



Chile

SOUTH AFRICAN COMPANIES MOVE INTO CHILEAN FISHING INDUSTRY:

A South African group of fishing companies (one of the well-known and well-established groups of fishing companies in South Africa and South-West Africa) has announced its intentions to enter the Chilean fishing industry in 1962. The company plans to build a fish meal plant at Iquique in northern Chile. A new company will be registered in that country and a fleet of purse seiners, similar to the pilchard boats used off South Africa and South-West Africa, will be purchased from Chilean boatyards.

The Managing Director of the group was expected to fly to Santiago early in November 1961 for an on-the-spot inspection of the situation. The group will probably purchase its boats from the Chilean subsidiary of a Seattle, Wash., marine construction company. This apparently had not been settled, but it is his understanding that, under Chilean law, the boats must be built there to operate in Chile's coastal waters.

The new plant in Chile will be built by a South African engineering firm. The Managing Director of that firm early in November left Cape Town for Santiago, Chile, and was also expected to visit Lima, Peru. The same company hopes to build fishing industry plants in both countries.

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UNITED STATES FIRM INVESTING IN CHILE'S FISHING INDUSTRY:

The General Manager of a Chilean-based company owned by a Seattle, Wash., marine construction firm has a number of fishery activities in Iquique, Chile.

The Chilean-based firm manages a fleet of three small fishing vessels with a capacity of about 50 tons each. This part of the operation is called "commercial exploratory fishing" and has been quite successful to date (October 31, 1961). The General Manager feels that his boats have definitely proven the superiority of well-equipped and well-managed vessels over the typical boat found in Iquique. He also pointed out that this operational fleet, which has been in operation about one year, has been an effective "traveling advertisement" for the shipyard.

The shipyard operation consists of a production-line boat-building plant set up on the outer mole of Iquique Harbor to build stock fishing vessels. The first keel was laid in July 1961 and the third keel was expected to be laid sometime after October 1961. It was estimated that the first hull was to be launched in late November or early December, and that thereafter one hull will be launched approximately every month.

The Seattle parent company does engineering consulting in such areas as fishing plants, installations, etc. Early in 1961 a study was completed for CORFO (Government Development Corporation) which indicated the feasibility of installing an integrated fish-processing plant in Iquique. CORFO has now taken the first steps in this respect by forming a fishery firm in Tarapaca.

The fishing industry in northern Chile represents a potentially rich and relatively undeveloped natural resource. In recognition of this and in an effort to offset economic disruption caused by the decline of the natural nitrate industry, the Government of Chile has adopted measures to stimulate and attract capital for the fishing industry in northern Chile.

The fact that American capital is being invested in Iquique's fishing industry indicates the potential of the new development policy. Over a period of time the equipment and techniques now being introduced should bring increased catches and development of the fish-processing industry. (October 30, 1961, report from United States Consulate, Antofagasta.)



Denmark

FISH FILLETS AND BLOCKS AND FISHERY BYPRODUCTS EXPORTS, JANUARY-SEPTEMBER 1961:

Denmark exported 7.1 million pounds of fresh and frozen fish fillets and blocks during September 1961—almost 2.9 million pounds more than in September 1960. Only 378,000 pounds, mostly cod and related species, were shipped to the United States in September 1961.

From January through September 1961, Denmark shipped 9.5 million pounds of frozen fish fillets and blocks to the United States, again mostly cod and related species.

Total Danish exports of fresh and frozen fillets and blocks January-September 1961 amounted to almost 54.0 million pounds, an increase of 17.0 million pounds over the same period in 1960. Exports of fillets and blocks of cod and related species increased by 25.7 percent, and flounder and sole exports were up 28.5 percent.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Byproducts, January-September 1961 ^{1/}				
Product	September		Jan.-Sept.	
	1961	1960	1961	1960
Edible Products:	..... (1,000 Lbs)			
Fillets and blocks:				
Cod and related species .	1,484	1,582	25,880	20,596
Flounder and sole	3,996	2,466	19,608	15,260
Herring	1,594	-	7,582	-
Other	40	2/171	927	2/1,095
Total	7,114	4,219	53,997	36,951
Industrial Products:	..... (Short Tons)			
Fish meal, solubles, & similar products	5,957	1,897	39,491	29,515

^{1/}Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

^{2/}Includes herring fillets.

Denmark's exports of fish meal, fish solubles, and other similar products rose from 1,897 short tons in September 1960 to 5,957 tons in September 1961. Exports of those products for the first nine months of 1961 were 33.8 percent greater than for the same period in 1960.



Fiji Islands

JAPANESE TUNA BASE PLANNED:

The proposed establishment of a Japanese tuna base at Levuka, Fiji Islands, under the plan initiated by a Japanese Liberal Democratic Party member is making steady progress. On November 10, 1961, a general meeting to formally organize the South Pacific Ocean Tuna Fishing Cooperative was held, at which time February 1963 was set as the target date for commencing operations.

Under a four-year plan, the Cooperative will start fishing operations in the first year with

25 65-ton vessels^{1/} and eventually increase the fleet to a total of 100 vessels, at the rate of 25 vessels a year. All catches made by the fleet are to be delivered to a canning company in Levuka, a joint British-Japanese enterprise formed in August 1961 with a capital of 300 million yen (US\$333,000), with each country investing 50 percent.

The Cooperative is to be operated as a self-supporting enterprise and plans call for the emigration of Japanese fishermen to the Fiji Islands. Fishing licenses would be issued to the Cooperative but not to individual vessel owners. These licenses would eventually be transferred to vessel owners. As investors, vessel owners will share in the profits of the Cooperative in proportion to the production of their vessels but will not participate in its management. The head office of the Cooperative is to be located in Tokyo and a branch office established in Levuka.

The above plan to establish a base at Levuka is reported to have been formulated to help the struggling medium and small fishing cooperatives of Japan; however, it is strongly opposed by the three largest Japanese fishing companies which operate tuna mothership fleets in the South Pacific. These three tuna mothership companies fear that the establishment of a tuna base in the Fiji Islands would not only jeopardize the operation of their fleets, but an increase in fishing intensity would result in overfishing and eventually deplete the tuna resources in the area. (Suisan Keizai Shimbun, November 11, 1961.)

^{1/}Earlier press reports indicated that this base would be established under a five-year plan with 20 vessels a year to be assigned to it.



German Federal Republic

NEW FISH REDUCTION METHOD TESTED SUCCESSFULLY:

A new German fish reduction method involving the use of electrophoresis and electrostriction to remove the cellular fluids from the tissue of fish and fish offal has been developed by the German inventor Heinz Doeven-speck in Bremen, according to a United States Consulate report of November 20, 1961, from Bremen. The new method obviates the need for external heat, and permits the extraction of oil and raw protein at temperatures of not over 45 degrees centigrade (113° F.).

The following advantages of the new procedure have been claimed by the inventor: (a) vitamins and essential amino and fatty acids, which are destroyed to a large extent by the conventional cooking process, are

German Federal Republic (Contd.):

saved; (b) the oil obtained under the new method remains fully emulsive; (c) extraction costs may be reduced about 30 percent; (d) the yield of fish oil is about 2-3 percent higher than under the conventional extraction method, while that of meal is about 10 percent higher; (e) "by-taste" of fish is avoided when fish meal produced by the new method is used in meat, egg, and milk production; (f) the required plant can be built from commercially-available equipment, requires about 50 percent less space than conventional plants, and can be installed aboard fishing boats and even on trucks; (g) the generation of undesirable odors is practically eliminated as the result of the low processing temperatures.

In cooperation with the largest West German trawler and fish processing company, the inventor has been conducting large-scale tests for the reduction of fish and fish offal in Bremerhaven during the past few months.

Since the inventor has now applied for patents on his invention in the United States, he is interested in establishing contacts for the utilization of his invention in the United States. He has no definite ideas on the form of utilization which he would prefer. He has entered into an informal understanding with a leading United States producer of fish oil and meal that he will give priority consideration of any offer made by the latter for his invention, if such offer matches or exceeds offers from other United States interests. Interested parties are invited to communicate with the inventor directly.

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FISH MEAL PRICES, NOVEMBER 3, 1961:

Prices reported at Hamburg Commodity Exchange as of November 3, 1961, for fish meal delivered ex-Hamburg warehouse, or c. & f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton ^{1/}	US\$/Short Ton
German	50-55	loco/ prompt	547,50	124,17
"	55-60	" "	557,50	126,44
"	60-65	" "	575,00	130,41
" sud. brands	60-65	Nov. 1961	618,50	140,28
" herring	64-68	prompt/Nov. 1961 ^{2/}	640,00	145,15
Peruvian	65-70	prompt/Dec. 1961	535,00	121,34
"	65-70	Jan. -July 1962	532,50	120,77
Angola	65-70	loco	592,50	134,38
"	65-70	Nov. 1961/Jan. 1962	585,00	132,68
Portuguese	50-55	Nov.-Dec. 1961	542,50	123,04
Icelandic herring	70-75	Nov. 1961	675,00	153,09
South African	65-70	Dec. 1961	580,00	131,54
"	65-70	Jan.-Apr. 1962	560,00	127,01

^{1/}Values converted at rate of 4,0 deutsche marks equal US\$1.
^{2/}Delivered coastal location.
 Note: "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

Thus far, the capacity of the plant has successfully been tested at a throughput of about 2,500 pounds of raw material per hour. It is expected that this quantity can be increased without difficulty to about 3,500 pounds in the near future.

The inventor stated further that feed tests conducted by chicken farms with fish meal produced by his new method showed that even though the raw protein content of the feed was reduced 50 percent, egg production rose 10 percent because of the superior quality of the fish meal. The new method can also be applied to the processing of meat and oil fruits (olives, papaya, coconuts, etc.). In the opinion of the inventor, the complete absence of odor would make his products, particularly fish flour, suitable for use in those countries where the consumption of animal protein foods meets with religious prejudice. Another promising field of application was seen by the inventor in dairying and animal husbandry. After the separation of butter from milk, the remaining product could be reduced to powder for long-term storage and/or transport to remote destinations, where it could be reconstituted into high-quality milk by the addition of odorless, fully emulsive meat fats produced by the new method. Such reconstituted milk could also be used for cattle feed, particularly calves, and possibly open new fields for using the surplus West European production of skimmed milk and meat fats. The inventor is exploring the possibilities of using his invention in this field with a leading West German lard importer and processor. The application of his invention to the extraction of vegetable oils is being tested by the Spanish Instituto de Grasa y Su-Derivates of Seville.

As compared with October 6, 1961, fish-meal prices on the Hamburg Exchange on November 3, 1961, were mixed, with both domestic and imported fish meal somewhat lower on the average. (United States Consulate, Bremen, November 7, 1961.)

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FISH OIL SUPPLIES ARE LIBERAL:

West Germany's imports of edible fish oils reached 32,110 short tons during January-June 1961, somewhat greater than in the same period of 1960. However, warm summer weather caused domestic consumption to decline below the seasonal level in the summer months. Sales of fish oil for local use and export were thus small.

As of mid-year 1961 production of edible fish oil in West Germany, and several other European countries, was running ahead of 1960. The resulting build-up in fish oil supplies caused some foreign buyers to withhold purchases in hopes of lower oil prices. German importers of fish oil adopted a similar

German Federal Republic (Contd.):

stand with the hope that United States and Peruvian fish oil prices would decline under the weight of heavy oil supplies. The United States and Peru are the major suppliers of fish oil to West Germany. (Foreign Crops and Markets, November 13, 1961, U. S. Department of Agriculture.)

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FISH BODY OIL MARKET:

Although October 1961 sales of fish body oils increased somewhat over those of the previous month, they continued sluggish and prices were depressed, according to the leading importer of fish oil in Bremen.

It is estimated that the West German production of edible fish body oil in 1961 will reach about 25,000 metric tons as compared with 23,700 tons in 1960. Prices for

terdam or Scandinavian ports. Reportedly, the Peruvians have begun to ship their fish oil in bulk in shiploads of about 10,000 tons to West European ports. The local trade source has estimated that Peruvian fish oil production will probably increase from about 100,000-105,000 metric tons in 1961 to about 140,000 tons in 1962.

The price at which United States menhaden oil was offered for sale early in November dropped to about \$116-\$118 per metric ton (5.3-5.4 U.S. cents a pound) c.i.f. Rotterdam or Scandinavian ports. (United States Consulate, Bremen, November 3, 1961.)

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FOREIGN TRADE IN FISH BODY OILS,
JANUARY-JULY 1961:

West Germany's imports of fish body oils during the first 7 months of 1961 totaled 32,502 metric tons valued at US\$4.9 million, an increase of 7 percent in quantity but a decrease of 2 percent in value as compared with the first 7 months of 1960.

Table 1 - Federal Republic of Germany Imports and Exports of Edible Fish Body Oils

Country of Origin	Imports							
	August 1961			% of Total by Weight August		Average Prices ^{2/}		
	Quantity	Value 1/		1961	1960	1961	1960	
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.¢/Lb.)
Belgium-Luxembourg	15.7	9	2	0.3	-	573	-	6.5
Denmark	850.3	518	129	17.2	4.8	609	679	6.9
Netherlands	148.6	88	22	3.0	3.8	592	606	6.7
Norway	1,494.3	1,123	281	30.3	10.6	752	761	8.5
Portugal	18.3	10	3	0.4	-	546	-	6.2
United States	427.0	255	64	8.7	49.8	597	679	6.8
Chile	323.0	173	43	6.5	-	536	-	6.1
Peru	1,655.7	987	247	33.6	17.2	596	646	6.8
Total August 1961	4,932.9	3,163	791	100.0	-	641	-	7.3
Total August 1960	6,409.4	4,359	1,090	-	1/86.2	-	680	-
Country of Destination	Exports							
	August 1961			% of Total by Weight August		Average Prices ^{3/}		
	Quantity	Value 3/		1961	1960	1961	1960	
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.¢/Lb.)
Netherlands	203.4	112	28	6.3	11.3	551	654	6.2
Norway	3,011.5	1,827	457	93.7	39.9	607	661	6.9
Total August 1961	3,214.9	1,939	485	100.0	-	603	-	6.8
Total August 1960	1,312.5	870	218	-	4/51.2	-	663	-

1/Believed to be the value at port of entry in Germany.

2/Other countries: Iceland - 10.7 percent; Angola - 3.1 percent.

3/Believed to be the value at port of shipment in Germany.

4/Other country: Sweden - 48.8 percent.

Source: Federal Office of Statistics, Wiesbaden.

German fish body oil are currently at about DM 460 per metric ton (5.2 U.S. cents a pound) ex factory. It is expected that about 70-80 percent of the West German production of fish body oil will be exported in 1961, as in previous years, although at considerably reduced prices.

The price of Peruvian semirefined fish oil dropped further during October 1961. According to a Bremen trade source, Peruvian oil early in November 1961 was offered at \$114 per metric ton (5.2 U.S. cents a pound) c.i.f. Rot-

The average c.i.f. import value declined from 7.4 U. S. cents a pound during 1960 to 6.77 cents a pounds for the first 7 months of 1961. Heavy imports of anchovy oil from Peru during 1961 (up 13,982 metric tons or 156 percent from the same period of 1960) depressed prices to below United States mar-

German Federal Republic (Contd.):

Table 1 - West Germany's ¹/₂ Imports of Edible Fish Body Oils, January-July 1961 and 1960

Origin	January-July 1961			January-July 1960		
	Quantity		Value	Quantity		Value
	Metric Tons	Deutsche Marks 1,000		Metric Tons	Deutsche Marks 1,000	US\$ 1,000
United States	920	621	155	9,742	6,708	1,608
Denmark	-	-	-	1,045	710	170
United Kingdom	-	-	-	359	245	59
Iceland	598	407	102	200	142	34
Netherlands	1,092	612	153	961	621	149
Norway	1,502	1,338	335	1,824	1,507	361
Portugal	1,241	778	194	1,347	857	205
Angola	1,783	1,014	254	2,838	1,904	456
S. Africa Republic	-	-	-	1,334	924	222
Canada	280	217	54	948	639	168
Chile	1,708	949	237	851	548	131
Peru	22,968	13,591	3,338	8,986	6,181	1,482
Other Countries	410	231	58	-	-	-
Total	32,502	19,758	4,940	30,435	21,046	5,045
¹ /Includes West Berlin.						

ket prices. Consequently, West Germany's imports of fish body oils (mostly menhaden) from the United States decreased by 8,822 metric tons, or 91 percent during the first 7 months of 1961 (see table 1).

same time in 1960. A total of 64 net herring boats were operating off those coasts. Some of the fish was transferred to trawlers and shipped on ice to West Germany. Other herring was frozen, particularly for Czechoslo-

Table 2 - West Germany's Exports of Edible Fish Body Oils, January-July 1961 and 1960

Destination	January-July 1961			January-July 1960		
	Quantity		Value	Quantity		Value
	Metric Tons	Deutsch Marks 1,000		Metric Tons	Deutsch Marks 1,000	US\$ 1,000
Denmark	-	-	-	790	534	128
Netherlands	1,267	791	198	1,110	779	187
Norway	3,490	2,153	538	3,987	2,748	659
Sweden	5,008	3,042	761	4,286	2,926	701
United Kingdom	505	314	78	-	-	-
Total	10,270	6,300	1,575	10,173	6,987	1,675

Later in the summer menhaden oil producers in the United States lowered their prices to compete with Peruvian oil, which resulted in a substantial increase in shipments to Germany during August and the fall months of 1961. (United States Consulate, Bremen, October 6, 1961.)



Iceland

FISHERY TRENDS AS OF NOVEMBER 1961:

As of early November 1961, Iceland's southwest coast winter herring season had been proceeding more favorably than at the

vakia and East Germany, and the rest was salted or used for fish meal and oil. The news of a contract with Poland for delivery of 20,000 barrels of salted herring was announced.

During the week of November 6, 1961, Icelandic trawlers reported record high prices for sales of fresh fish on ice at Grimsby, England. Good prices for fresh fish on ice were also received at West German ports. Poor fishing weather in the North Sea was reportedly the reason for the high prices. (United States Embassy, Reykjavik, November 9, 1961.)

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Iceland (Contd.):

FISH PRODUCTION, JANUARY-JULY 1961:

How Utilized	January-July	
	1961	1960
	.. (Metric Tons) ..	
Herring/ for:		
Oil and meal	113,758	65,857
Freezing	9,445	1,368
Salting	50,542	12,369
Fresh on ice	4,119	645
Groundfish/ for:		
Fresh on ice landed abroad	16,312	11,798
Freezing and filleting	99,409	144,252
Salting	59,876	63,462
Stockfish	42,040	50,470
Home consumption	4,751	5,102
Oil and meal	2,378	3,610
Shellfish for:		
Freezing: Lobster	1,287	1,196
Shrimp	304	-
Canning (shrimp)	126	-
Total production	404,347	360,129
1/ Whole fish.		
2/ Drawn fish.		



Iran

IMPORTS OF MOST FISHERY PRODUCTS PROHIBITED:

Import regulations for the Iranian Year 1340 (March 21, 1961 to March 20, 1962) established an over-all import quota for all commodities. Imports of all goods except those on the prohibited import list may be imported free of licensing controls. But most fishery products are on the prohibited import list. Included are all canned fish, crustaceans (such as shrimp and lobster, prepared and preserved), mollusks, caviar and fish eggs and the like, as well as fish meal. Since fresh and frozen fish and other types of fishery products are not mentioned specifically in the prohibited list nor in the list of goods subject to the commercial profits tax, it is assumed that those products may be imported free of licensing controls.



Israel

THREE NEW DEEP-SEA TRAWLERS PLANNED:

Israel's Department of Fisheries has announced the approval of plans for the construction of three new deep-sea trawlers which will cost between I£1.0 million and I£1.5 million (US\$1.8 and \$2.7 million) each. They will be ordered from foreign shipyards for delivery in 1963.

This step is seen as a confirmation of an earlier policy decision to boost fishing in international waters. Plans call for operating one of the new vessels in the Canary Islands fishing grounds in the Atlantic. The second, a tuna clipper, will operate in the Indian Ocean off Madagascar and the coast of Africa. The third will be a large trawler to fish in the Red Sea, with Eilat as its home base.

Israel's Ministry of Agriculture has also approved an I£300,000 (US\$540,000) fishing boat pier at Eilat, which will include cold-storage facilities to handle catches from the Red Sea. (United States Embassy, Tel Aviv, report dated November 22, 1961.)



Ivory Coast

U. S. COMPANY INVESTS IN FISH PLANT:

A California canning firm, in a 50-50 venture with private French capital, has concluded an agreement with the Ivory Coast Government to construct tuna freezing and storage facilities at the port of Abidjan. Construction of the facilities is expected to cost the new company in the Ivory Coast about US\$400,000. The plant will have capacity for freezing 130 tons per day, storage for 1,300 tons, and ice plant with a capacity of 60 to 80 tons per day.

The new firm will subcontract the actual fishing to French and Spanish fishermen, operating from 40 to 50 boats, and will also buy fish from Japanese vessels in the area.

The plant will be located at the old Abidjan port rather than at the new port to be completed in 2 or 3 years by the Government of Ivory Coast. Production will be possible in a short time with prefabricated storage and freezing units. (United States Embassy, Abidjan.)



Japan

FISHERY AGENCY UNDERTAKES TUNA PRODUCTION AND MARKETING STUDIES:

According to recent Japanese press reports, Japanese Minister of Agriculture and Forestry Kono conferred with U. S. Secretary of the Interior Udall regarding Japanese exports of tuna to the United States during the

Japan (Contd.):

latter's visit to Japan to attend the Joint Economic Meeting held in Tokyo in November 1961. Minister Kono is reported to have stated to Secretary Udall that restrictions placed by the United States on imports of Japanese tuna and increased exports of canned tuna to the United States by other countries are presenting serious problems to the Japanese tuna industry, and the Minister discussed the possibility of increasing exports of frozen tuna and canned tuna to the United States. Secretary Udall is reported to have stated that this was a matter which required further study, to which Minister Kono agreed.

Accordingly, Minister Kono has instructed the Fishery Agency to undertake a study of Japanese tuna production potential and market conditions. The Agency has made the study and is expected to submit a full report to Minister Kono shortly.

Latest press reports state that the Agency scheduled a preliminary meeting for November 21 to develop basic guides for the study. Reportedly, the Japanese hope to predict the demand for tuna in the United States as far ahead as 1970 and to estimate the amount of tuna that Japan can produce to meet this demand. (Shin Suisan Shimbun Sokuho, November 21, 1961; and other publications.)

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TUNA INDUSTRY PROPOSES LOBBY IN UNITED STATES:

The Government-Industry meeting of the Japanese Export Promotion Council convened on November 9, 1961, to discuss among other proposals, a frozen tuna industry proposal that negotiations at government levels be conducted in an effort to remove import restrictions imposed by foreign countries on Japanese tuna exports and that lobbyists be actively employed in the United States to block any movement aimed at tightening United States import restrictions on Japanese frozen tuna. The tuna industry also recommended the establishment of joint fishery bases abroad to regulate the tuna market. The marine products canning industry urged the Government to seek measures to relax, and if possible, remove tariff barriers of the United States and European countries.

This meeting was attended by Prime Minister Ikeda, International Trade and Industry

Minister Sato, Foreign Minister Kosaka, Finance Minister Mizuta, Agriculture and Forestry Minister Kono, Transportation Minister Saito, Bank of Japan President Yamagiwa, and other Government leaders. The fishing industry was represented by the President of Taiyo Fishing Company. (Shin Suisan Shimbun Sokuho, November 10, 1961; Suisan Keizai Shim-bun, November 10, 1961.)

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PRODUCERS ASSOCIATION PLANS TO INCREASE FROZEN TUNA EXPORT QUOTAS TO UNITED STATES:

On October 24, 1961, the Japanese Export Frozen Tuna Producers Association's Board of Directors adopted the following proposals on frozen tuna direct export quotas to the United States for the current Japanese fiscal year:

(1) Increase yellowfin exports from the present 30,000 short tons to 35,000 metric tons; (2) establish a special combined quota of 5,000 metric tons for yellowfin and albacore, with time and method of allocation of said quota to be determined by the Board of Directors; (3) increase tuna loin exports by 1,200 metric tons. Of this amount, 600 tons shall be allocated at the same time that the special quota of 5,000 tons indicated in (2) are allocated, and the remaining 600 tons of loins set aside as a special quota.

The above proposals were to be considered for adoption at a special general meeting of the Producers Association on November 7. If adopted, the new quotas would go into effect December 1. (Shin Suisan Shimbun Sokuho, October 26, 1961.)

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FROZEN TUNA AND SWORDFISH EXPORTS TO UNITED STATES TO BE INCREASED:

The Japanese Export Frozen Tuna Producers Association's Board of Directors held a special general meeting on November 7, 1961, and adopted the following proposals on frozen tuna exported from Japan proper to the United States:

1. Increase the yellowfin tuna export quota by 5,000 short tons, from the present 30,000 short tons to 35,000 tons. This increase of 5,000 tons will be allocated as follows: 4,000 tons on the basis of past performance records and 1,000 tons unassigned (so-called free quota).

Japan (Contd.):

2. Establish a separate special quota of 5,000 short tons for albacore and yellowfin tuna, the allocation of which shall be determined by the Association's Board of Directors.

3. Increase the tuna loin export quota by 600 short tons, from the present 3,500 tons to 4,100 tons. This increase of 600 tons will be allocated as follows: 570 tons on the basis of past performance records and 30 tons unassigned. Establish an additional special loin quota of 600 short tons, the allocation of which shall be decided by the Board of Directors.

4. Increase the frozen swordfish export quota by 1,000 short tons, from the present 5,500 tons to 6,500 tons. This increase of 1,000 tons shall be allocated as follows: 875 tons according to past performance records; 120 tons unassigned, and 5 tons to newly authorized exporters. In addition, establish a special 500-ton quota, the allocation of which shall be determined by the Board of Directors.

The increases in export quotas mentioned, with the exception of the special quotas (albacore-yellowfin tuna quota of 5,000 tons; loin quota of 600 tons, and swordfish quota of 500 tons), became effective December 1, 1961. However, it was reported that the Japanese Frozen Foods Exporters Association doubted the value of increasing the frozen swordfish export quota to the United States by 1,000 short tons (really 1,500 tons if the special quota of 500 tons is added). It considered a maximum of 700 tons to be a more reasonable increase, and while the swordfish export quota has been increased by 1,000 tons effective December 1, actual shipments may not likely exceed 700 tons. (Suisan Tsushin, November 8, 1961.)

Translator's Note: The following table shows current Japanese export quotas of frozen tuna destined for the United States, including the increases effective December 1:

Japanese Frozen Tuna Export Quotas		
Species	Shipments to U. S. from	
	Japan Proper	Transshipments
	..... (Short Tons)	
Albacore	30,000	5,000
Yellowfin	35,000	30,000
Yellowfin-albacore	5,000	-
Tuna loins/	4,700	-
L/Includes special quota of 600 tons.		

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FROZEN SWORDFISH EXPORT QUOTA TO UNITED STATES INCREASED:

The Japanese Export Frozen Tuna Producers Association early in November 1961 tentatively decided to increase the frozen swordfish export quota for the United States to 6,500 short tons in view of the increasing demand for swordfish in the United States. This is an increase of 1,000 tons over the previous 5,500-ton quota set in March 1961 for the Japanese fiscal year (April 1961-March 1962).

Normally, by the end of October, close to 1,000 tons of frozen swordfish remain in stock, but in 1961 the supply of swordfish was used up by the end of September. The 1961 fiscal year quota of 5,500 tons for export to the United States was allocated as follows: April-September, 2,750 short tons; October-December, 1,375 short tons; January-March, 1,375 short tons. (Shin Suisan Shimbun Sokuho, November 4, 1961.)

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TUNA FISHING CONDITIONS IN EASTERN PACIFIC, OCTOBER-NOVEMBER 1961:

The Marine Research Laboratory of Tokai University, Japan, early in November 1961 issued a report on tuna fishing conditions in the eastern Pacific the latter half of October and early November 1961.

Fishing in the vicinity of 107° to 114° W. longitude and 0° to 3° N. latitude averaged 5 tons per day per vessel. Fishing was also at the same rate west of 120° W. longitude. Big-eyed and yellowfin tuna made up the bulk of the catches.

Fishing continued since mid-October in the vicinity of 115° to 118° W. longitude and 4° to 5° S. latitude, averaged 5.2 metric tons per day per vessel. Fishing in other areas was slow. (Suisan Keizai Shimbun, November 10, 1961.)

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FISHING FIRMS HOPE TO IMPORT FROZEN TUNALIKE FISH FROM SOUTH AFRICA:

Now that the Japanese Government liberalized trade in marine products beginning October 1, 1961, the major Japanese fishing companies are reported to be seeking ways and means of importing frozen tunalike fish and spearfish to Japan. Domestic demand for tuna is expected to be good and a shortage is expected, especially for tuna used in the production of fish ham and sausage.

Japan (Contd.):

The large companies appear to be most interested in importing spearfish, for which there is no export market. Spearfish can be imported from South Africa for about \$300 a metric ton delivered to Japan, and Japanese firms seem to want to import spearfish particularly from Formosa, Australia, and the coastal countries of South Africa. Already one large fishery firm is reported to have imported frozen spearfish from an undesigned foreign country. (Shin Suisan Shimbun Sokuho, October 26, 1961.)

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RECORD TUNA TRIP AT YAIZU:

In October 1961 the Japanese long-liner Fukuhisa Maru No. 8 (408 tons) established the highest landing record of a single tuna vessel since the establishment of the Yaizu fish market in Shizuoka Prefecture. The vessel landed Indian (bluefin) tuna, including big-eyed, caught off Mexico. In three days it unloaded 330 metric tons valued at \$91,000.

The previous highest record was 155 tons valued at \$81,389 landed by the Showa Maru No. 2 in August 1960.

The ex-vessel market price of Indian (bluefin) tuna ranged from a high of \$679 a metric ton to a low of \$163 a ton, but most of it sold at \$175 a ton because of purchases by packers. The better grades were sold to Kansai buyers at an average of about \$201 per ton. (Japanese periodical.)

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JAPANESE TO EXPLORE FOR NEW TUNA RESOURCES OFF CEYLON:

A November 1961 report indicated that a two-man team of Japanese fishery experts would be dispatched to the Maldive Islands to conduct exploratory work in January 1962 in accordance with an agreement reached between Japan and the Maldive Dependency of Great Britain.

The Maldive Islands located near the southeastern tip of India are reported to have a population of approximately 90,000, of which 70 percent are engaged in fishing (primarily for skipjack tuna) and processing of marine products.

In addition, the Japan Overseas Fisheries Cooperative Association planned to charter

the Shizuoka Prefectural Fisheries Research Laboratory's research vessel Fuji Maru (191 gross tons) to survey the waters off Ceylon, Nicobar Islands, and the Maldive Islands for a period of approximately three months beginning November 16, 1961. The vessel would investigate skipjack resources and the presence of live bait in an effort to develop new fishing grounds for the Japanese tuna fishing industry. This study would cost approximately 3.2 million yen (US\$8,900), of which the Japanese Ministry of Agriculture would contribute 50 percent. Shin Suisan Shimbun Sokuho, October 28 and November 4, 1961; Suisan Keizai Shimbun, October 25, 1961.)

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FREIGHT RATES FOR CANNED TUNA SHIPMENTS TO UNITED STATES BOOSTED 6 PERCENT:

A 6-percent increase in freight rates for Japanese shipments of canned tuna to the United States was reportedly approved for November 1, 1961, to April 30, 1962, by the Japanese Freight Conference. Freight rates for canned salmon and canned crab were to be raised by 10 percent from November 1, also. Thus, the freight charges for canned tuna will be about two cents less per case than for other canned fishery products. The new freight rates for canned marine products are:

	Destination		
	Pacific Coast	Atlantic Coast	Overland Common Points
	.....(US\$/Short Ton).....		
Old Rate:			
Canned tuna	24.25	30.00	22.50
New Rate:			
Canned tuna	25.75	31.75	24.25
Others ¹ /	26.75	33.00	22.75

¹/Includes products such as canned salmon and canned crab.

Freight rates for frozen tuna shipped from Japan proper to the United States remained unchanged. As of late October freight rates for frozen tuna were: \$57.75 a short ton for albacore, skipjack, yellowfin, big-eyed, and bluefin; \$78.75 for tuna loins; and \$68.25 for tuna filets. As for freight rates for frozen tuna shipments from the Atlantic Ocean to Japan, the Japanese Freight Conference informally approved the continuance of current freight rates. This decision was based on the Japan Frozen Tuna Sales Company's contention that the 7.5-percent increase in freight charges recommended by the Freight Conference would result in an excessive increase in the sales price of frozen tuna. (Shin Suisan Shimbun, November 4, 1961; Suisan Tsushin, October 23, 1961.)

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Japan (Contd.):

FROZEN SABLEFISH SHIPPED TO U. S.:

Japanese fishing companies since the summer of 1961 have been encouraging exports of frozen sablefish or silver cod caught in the North Pacific. As of mid-October 1961 a total of 180 short tons had been contracted for export. The buyers are on the west coast of the United States (130 tons) and Hawaii (50 tons).

The price is 20-22 U. S. cents a pound c. & f. for large fish more than 5 pounds each, and fish weighing less than 5 pounds are offered 4 to 5 cents cheaper.

Since frozen sablefish are used for smoking and large fish caught with long line are preferred, the amount available for export is small and demand is expected to exceed the supply. (Suisan Tsushin, October 21, 1961.)

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SURVEY SHOWS LARGER TUNA VESSELS BEING CONSTRUCTED:

Data compiled by the Japanese National Federation of Tuna Cooperative Associations show that the number of vessels of 40 and 180 tons gross in the Japanese tuna fleet is diminishing steadily, while the number of vessels over 180 tons gross is increasing. Vessels between 40 and 180 tons gross are being used for replacement purposes to construct larger distant-water vessels of over 180 tons gross, which the Japanese consider more efficient.

Numbers of Japanese Tuna Vessels by Size Class and Year/				
Vessel Size (Gross Tons)	1960	1959	1958	1957
40- 70	167	179	207	200
70-100	344	387	415	422
100-180	279	327	365	389
180-240	70	66	59	50
240-350	121	98	82	73
Over 350	151	130	115	109
Total	1,129	1,187	1,243	1,243
1/Does not include tuna vessels under 40 tons gross, which do not require licenses; and 40- to 80-ton vessels which engage in other fisheries.				

Table does not include tuna vessels in the 40- to 80-ton range which engage in other types of fishing or former salmon vessels which have switched to tuna fishing. Those types of vessels total 266, of which 49 are former salmon fishing vessels. (Suisan Keizai Shimbun, November 8, 1961.)

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FISH MEAL FACTORYSHIP DEPARTS FOR ANGOLA:

The Japanese fish meal factoryship Renshin Maru (14,094 gross tons) departed Japan for Angola, Africa, on October 30, 1961. This voyage was expected to take 30 days. The Renshin Maru will remain on the fishing grounds for about 70 days until early February 1962, during which time she will be anchored within six miles off the Angolan coast. Her production target is 7,300 metric tons of fish meal (of which 2,300 tons are to be turned over to Angola), 1,500 metric tons of fish solubles, 1,000 tons of fish oil, and 1,500 tons of frozen fish.

The Renshin Maru normally operates as a fish meal factoryship in the eastern Bering Sea during the summer months. For the first time the vessel is being sent to the waters off Angola to process anchovies for fish meal.

Under arrangements worked out between Angola and Japan, Angolan fishermen will sell their catches to the factoryship. About 40 Angolan vessels will be assigned to supply anchovy to the factoryship and 14 trawlers will deliver to the factoryship fish for freezing. Fish caught by the catcher vessels will be transferred to the Renshin Maru by means of 4 fish pumps, which were installed on the factoryship just before her departure at a cost of 5 million yen (US\$14,000) each.

The two 120-ton trawlers which will work in conjunction with the Renshin Maru departed Japan on October 20. The two vessels will explore grounds beyond the territorial waters of Angola primarily for shrimp. (Suisan Tsushin, October 23, 27, and 31, 1961.)

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ANTARCTIC FISHERIES RESOURCES TO BE STUDIED:

The Japanese Ministry of Education announced late in October 1961 that biological research and observation of the Antarctic will be carried out with the Tokyo Fisheries College training ship Umitaka Maru. The ship was to sail from Tokyo at the end of October, returning in March 1962.

The investigation will be carried out every other year by a team of 11 in the sea area between 20° east longitude, and 50° west longitude.

The subjects of observation include various problems relative to resources and potential

Japan (Contd.):

fisheries, including beam-trawling, and oceanic observations from the Antarctic to Cape Town, Africa, (Suisan Keizai Shimbun, October 27, 1961.)

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FISHING ACTIVITIES IN THE BERING SEA:

Catch statistics released by the Japanese Fishery Agency show that for the period April-October 1961 the 33 Japanese mothership-type bottom trawl, long-line, and gill-net fleets which operated principally in the north central and eastern Bering Sea landed a total of 621,114 metric tons of fish and 96,410 crabs.

The Japanese Northern Waters Mothership Association has decided to organize a council to regulate and

COMMERCIAL FISH HATCHERIES AND FISH FARMS:

Although Japan is surrounded by seas and is renowned for its marine fishing ingenuity, it is still unable to meet the growing domestic demand for certain kinds of fish. Encouraged by this demand, commercial fish culture in Japan has made remarkable progress.

Unique fish-culture projects include those for eels, shrimp, and turtles--products which are considered essential to Japanese cuisine. Hatcheries for such expensive fish as sea bream and mullet are also doing well. Eels are widely appreciated for their rich taste as well as for their abundant vitamin A content, which is 300 times that of beef. Shrimp are used in the cuisine of practically all nations, and in Japan, the demand is exceedingly good as it is an essential ingredient for "tempura" (shrimp dipped in a special batter and deep-fat fried). Turtles are regarded by epicurians as an effective tonic food as well as a delicacy. These three products are sold at fancy prices on the Japanese market.

Japanese 1961 Bering Sea Landings by Species and Fishing Areas						
Species	Fishing Areas ^{1/}					Total
	A2/ (May-Oct.)	B2/ (Apr.-Sept.)	C (May-Oct.)	D (May-Oct.)	E (Apr.-Oct.)	
..... (Metric Tons)						
Flatfish	305	1,333	47,538	665	404,122	453,963
Halibut	1,995	6,248	2,762	-	-	11,005
Cod	1,541	2,861	631	214	1,517	6,764
Alaska pollock	69	193	979	343	22,820	24,404
Sablefish	3,630	8,420	6,683	6,723	770	26,231
Rockfish	1,383	1,586	1,494	1,796	4,284	10,543
Shrimp	145	143	71	9,601	265	10,225
Herring	23,251	48,511	44	28	426	72,260
Others	29	372	113	3,056	2,149	5,719
Total	32,348	69,667	60,315	22,431	436,353	621,114
..... (Number)						
Crabs	75,346	20,064	-	-	1,000	96,410
^{1/} Key to fishing areas:						
Area A: Between 170° E. and 175° E. longitude.						
Area B: Between 175° E. and 180° longitude.						
Area C: Between 180° and 175° W. longitude.						
Area D: Between 175° W. and 170° W. longitude.						
Area E: Area east of 170° W. longitude.						
^{2/} Catch from these two areas mainly off bank between Cape Olyutorski and Cape Navarin.						

coordinate the bottom trawl, long-line, and gill-net fishery in the Northern Waters (refers to the Okhotsk Sea, Bering Sea, and the North Pacific Ocean). To be formed by the 8 companies belonging to the Association and 3 other fishing companies, this council will be established within the Association and placed under the supervision of the Administrative Chief of the Northern Waters Mothership Association. The Association plans to admit into the council long-line and gill-net fishermen not now members of the council who plan to fish in Northern Waters.

The stern trawlers No. 50 Akebono Maru (1,425 gross tons) and No. 51 Akebono Maru (1,475 gross tons) departed Kurihama, Japan, for the eastern Bering Sea on November 10 and 11, 1961, respectively. These two vessels were expected to fish the grounds near the Pribilof Islands for about 50 days. (Nippon Suisan Shimbun, November 13, 16, and 18, 1961.)

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Today, there are 760 eel-raising farms in the country, mostly in the Hamanako Lagoon in Central Japan, where river water pours into the sea. In this area alone, 2,200 metric tons of eels are produced annually, with sales totaling some US\$2,800,000. These "farm-raised" eels are shipped to major cities where demand for broiled eels continues to grow. To show how popular broiled eels are, the Tokyo classified telephone directory lists nearly 1,000 eel specialty restaurants, some of which have enjoyed thriving business for more than 300 years.

Demand for shrimp is increasing rapidly, not only for the traditional "tempura" dishes but also for Chinese cuisine. As much as US\$670,000 worth of this particular shellfish had to be imported in 1960 alone to meet the growing demand. The acute and continued shortage of the domestic shrimp supply has stimulated the development of shrimp hatcheries and one hatchery recently succeeded in raising shrimp and marketing them at less than half the competitive price. These shrimp are now shipped by plane from a shrimp farm in Shikoku, Central Japan.

Japan (Contd.):

This shrimp-farm project was developed by Dr. Fujinaga, who previously served in the Government as director of the Research Bureau of the Fisheries Agency. Upon retiring from active service in September 1954, he opened a shrimp farm in Shikoku beside the Seto Inland Sea, utilizing a salt farm which had been closed. After confirming that 2,000,000 shrimp can be hatched from the eggs of a single female shrimp, he started raising shrimp in a special tank, and is now shipping grown shrimp to Tokyo every day. He is planning to present 50,000 female shrimp to both of the neighboring prefectures of Okayama and Kagawa. It is expected that the shrimp farms in Central Japan will eventually be able to produce 2,000 tons of shrimp a year.

"Suppon" or soft-shell turtles are generally believed to be a tonic food, but they are also a delicacy when prepared by an expert chef. The domestic supply of "suppon" is also too small to meet the growing demand and the price is always high. Despite the difficulties encountered in artificial raising, there are six "suppon" farms, mostly in the "Paradise of Hatcheries," the Hamanako area in Central Japan. In a typical farm, they are hatched and raised in ponds. There is a different pond for each age group ranging from one-year-olds through five-year-olds.

The commercial hatchery business is booming in Japan today. Aside from those already mentioned, there are numerous commercial hatcheries and farms for such freshwater fish as salmon and trout, carp, sweet-fish ("ayu"), bullfrogs, and others. Among salt-water fish culture, oyster farming is most prevalent, producing some 20,000 tons of oyster meats annually, followed by laver and kems (seaweed), and clams. (Japan Report, November 15, 1961, Japan Information Service, Consulate General of Japan, New York, N. Y.)

Note: See *Commercial Fisheries Review*, March 1960 p. 68.



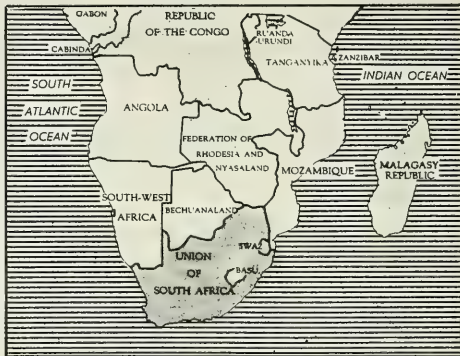
Malagasy Republic

TUNA CANNING DEVELOPMENTS:

A French company, which has small canning plants at Majunga, Diego Suarez, and Tamatave, has been negotiating with the Chinese Nationalist Tuna Fishing Fleet which has operated well off the Malagasy Republic (formerly Madagascar) coast for a considerable time, to furnish 140 metric tons of tuna. The Chinese have been ready to supply this amount for some time but have been held up by the firm who was expected to be ready to accept the tuna in December 1961. The firm intends canning the tuna and marketing it in Europe and the United States to determine whether a local tuna fishing and canning industry can be made to pay.

It is reported that previously an attempt was made to firm up arrangements with Japanese tuna vessels whereby they would furnish a trial lot of tuna and at the same time the Japanese would train Malagasy fishermen. This fell through because the Japanese wish to be paid for their catch in hard cur-

rency, a condition to which the Malagasy could not agree. The Chinese fishing fleet is reported to be willing to accept CFA francs. This may be due in a measure to the fact that if the establishment of a local tuna industry is possible, the Chinese fleet would then base on Diego Suarez, working out of that port, rather than returning to Formosa to dispose of their catch, a voyage which now requires about three months.



The Special Fund of the United Nations is further examining the fishing possibilities of Madagascar and has as a first approach the idea of setting up a school for training fishermen, this school to be a subdivision of the Agricultural College. The school would turn out monitors capable of instructing fishermen and of organizing and directing cooperatives.

Those who have interested themselves in this subject agree that the possibility of a paying fishing industry in Madagascar will depend less on the techniques and organization, as important as these may be, than on the finding of markets and the ability to compete with other suppliers of fish. Local consumption can be increased but probably not to the point where the transportation and refrigeration facilities required would be justified. Foreign markets must be found and held.

In addition to tuna fishing, attention is being given to the possibilities of exploiting the shrimp available off the Madagascar coast. This latter will require refrigerating and freezing facilities, calling for considerable capital outlay. (United States Operations Mission, Madagascar Republic, October 21, 1961.)



Mexico

SHRIMP EXPORTS TO U. S. MUST MEET MINIMUM FOOD AND DRUG STANDARDS:

Reliable sources in the shrimp industry in Mazatlan, Mexico, have stated that a notice received from the U. S. Food and Drug Administration states that effective November 13, 1961, all shrimp imported into the United States must meet the minimum standards set by that agency.

Responsible elements in the industry have realized for years that their product was not up to required standards but have been able to do nothing about it. It is believed that the freezing plants in general are satisfactory or with relatively little expense may be brought into line. The trouble lies in the boats and the handling of the shrimp before it reaches the packing houses.

When unloaded in port the boats return to the fishing grounds as quickly as possible without having their holds adequately cleaned. Frequently the catch is not handled properly immediately upon being hauled in. Because of a bonus system which provides a premium for a capacity catch the ships stay out as long as possible. (Report from United States Consulate, Mazatlan, November 8, 1961.)



Morocco

CANNED FISH EXPORT TRENDS:

Moroccan exports of canned fish have steadily expanded. The final results of the 1960/61 season (June 1, 1960-May 31, 1961) showed exports of 2,331,451 actual cases as compared to 2,066,569 cases for the previous season. Exports in the 1960/61 season consisted of: sardines 1,984,572 cases, tuna 130,988 cases, and other canned fish 215,981 cases. France, Italy, West Germany, and Ghana were the principal buyers of Moroccan canned fish products.

The current season (began June 1, 1961) got off to a good start with exports during June and July at a record high--425,351 cases as compared to 294,171 cases for the same two months the previous season. June and July 1961 exports consisted of sardines 304,369 cases, tuna 17,225 cases, and other canned fish 67,757 cases.

While prospects for the industry were good, the sardine packers expressed some worry over their privileged position in the French market. They fear that Portugal will follow the United Kingdom into the Common Market thus causing the Moroccan sardines to lose their competitive advantage, deriving from their admission free of French customs duties. (U.S. Embassy, Rabat, October 23, 1961.)



New Zealand

TUNA INDUSTRY PLANNED:

New Zealand is planning to start a tuna industry, according to the Governing Director of a New Zealand fishing firm. "The fish are available in our waters and we're going to develop our own industry," he said.

As a preliminary, private enterprise and the Government will combine in a 12-month tuna survey off New Zealand. The New Zealand survey will follow the pattern of similar surveys in Australia. In Australia fishermen have learned to follow tuna at the start of the season off the coast of New South Wales to Port Lincoln in South Australia. The Director of the New Zealand firm said New Zealand fishermen know that tuna abound off the North and South Islands and would follow them around and endeavor to establish their habits. He said that as tuna was not sold "fresh," it would probably be canned. (Fish Trades Review, September 1961.)



Nicaragua

SHRIMP FISHERY TRENDS:

A French shrimp fishing company, located at El Bluff on the Atlantic Coast, has been in serious financial difficulty and its operations are virtually at a standstill. Although other shrimp companies continue to export, shipments remain at a low level.

On the Pacific Coast, however, a United States shrimp firm has made an apparently successful start. It shipped 35,000 pounds of shrimp in September 1961 and plans to construct a processing plant near Corinto. (United States Embassy, Managua, October 25, 1961.)



Nigeria

JAPANESE-NIGERIAN JOINT FISHERY ENTERPRISE AT LAGOS:

A large Japanese fishing company is planning to establish a joint fishing base at Lagos, Nigeria. Total capital investment for this base is reported to be 50 million yen (US\$139,000), with Japan contributing 30 percent and Nigeria 70 percent. Of the Japanese share, the Japanese fishing company and another Japanese firm are contributing 50 percent each. The Nigerian share is to be put up by the Nigerian Government and a Nigerian shipping and trading company.

The base facilities will include a 500-ton capacity cold-storage plant. Construction of the plant is to be financed with approximately 500 million yen (US\$1.4 million) to be borrowed from the Japanese Overseas Fisheries Cooperative Fund, and negotiations over this matter the latter part of October 1961 were being conducted between the Governments of Japan and Nigeria. By agreement, this cold-storage plant may also be used by Japanese fishing vessels other than those fishing directly for the base.

The Japanese fishing company planned to dispatch a pair of two-boat trawlers to Nigeria in mid-December 1961. Eventually, a total of six trawlers, each of 100 tons gross, are to be based at Lagos. Annual production target for the fleet is 6,000 metric tons of croaker, for which a preliminary selling price of 60,000 yen (US\$167) a metric ton has been agreed on.

Concerning the construction of cold-storage plants elsewhere along the coast of West Africa, the same Japanese fishing company is constructing a 2,000-ton capacity cold-storage plant in Monrovia, Liberia, together with an Italian firm. This plant is scheduled to be completed in August 1962. (Shin Suisan Shimbun Sokuho, October 27, 1961.)



Norway

NORWAY-SOVIET TALKS ON NORWEGIAN FISHING LIMITS END:

Norwegian and Soviet negotiators have concluded talks at Oslo on continued permission for Soviet fishing craft to operate inside the Norwegian fishing zone between 6 and 12

nautical miles. Views of the two delegations will next be considered by their respective Governments.

Soviet negotiators maintained that there was a difference of principle between the Russian 12-mile territorial limit and the Norwegian 12-mile fishery limit. In their opinion, a Soviet commitment to buy Norwegian fish and fish products for several years could serve as a basis for an agreement on Soviet fishing rights.

The Norwegian delegation maintained that the reciprocal principle applied by Norway in these and similar negotiations involve a reasonable opportunity for Norwegian fishermen to operate in waters between 6 and 12 miles off the coast of the other nation. Whether the limit is called territorial or fishing limit makes no difference. (News of Norway, November 30, 1961.)

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FROZEN FISH EXPORTS INCREASE:

The Norwegian cooperative sales organization Norsk Frossenfisk A/L, whose brand frozen fish is now exported to 30 foreign countries, reported total sales of Kr. 94.8 million (US\$13.3 million) in the fiscal year that ended June 30, 1961. Since 1959, sales increased about Kr. 24 million (US\$3.4 million).

Frozen fish exports in 1960/61 earned about Kr. 80 million in foreign exchange, or about Kr. 7 million (US\$11.2 million) more than in the preceding fiscal year. Of the 27,900-ton total production, 25,200 tons were exported.

The largest single market is in the United States where the sales organization's products are sold by a subsidiary in Jersey City, N. J. Another subsidiary will expand its fish stick plant at Mobile, Ala., to meet growing demand in the United States.

In its annual report, the sales organization says that a Norwegian link with an enlarged Common Market (EEC) is of the utmost importance to the nation's frozen fish industry. An EEC link might have certain disadvantages, but they are trivial compared with the difficulties that would follow if Norway were to stay outside the trade organization. (News of Norway, November 4, 1961.)

Note: See Commercial Fisheries Review, February 1960 p. 86.

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Portugal

CANNED FISH EXPORTS, JANUARY-JUNE 1961:

Portugal's exports of canned fish during the first half of 1961 amounted to 29,378 metric tons, 13 percent more than in the same period of 1960. Sardines accounted for 82.4 percent of the 1961 exports, followed by anchovy fillets with 8.2 percent.

Portugal's principal canned fish buyers in the first half of 1961 were Germany with 6,033 tons, followed by Great Britain with 3,594 tons, and the United States with 3,397 tons.

Portuguese Canned Fish Exports, January-June 1960-1961				
Product	January-June			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	24,212	1,274	22,244	1,170
Chinchards	791	41	412	21
Mackerel	278	11	125	6
Tuna and tunalike	1,258	45	997	36
Anchovy fillets	2,699	270	2,062	206
Others	140	7	154	7
Total	29,378	1,648	25,994	1,446

In June Portugal exported a total of 4,842 tons of canned fish--sardines accounted for 76.8 percent of that total. Also during June, exports to the United States consisted mainly of canned sardines (208 tons), anchovies (101 tons), tuna and tunalike fish (98 tons), and mackerel (5 tons). (*Conservas de Peixe*, August 1961.)

* * * * *

CANNED FISH PACK, JANUARY-JUNE 1961:

Portugal's total pack of canned fish in oil or sauce for the first half of 1961 amounted to 16,115 metric tons, an increase of 4,306 tons or 36 percent over the same period in 1960. The sardine pack and the anchovy fillet pack combined accounted for 83.1 percent

Portuguese Canned Fish Pack, January-June 1960-1961				
Product	January-June			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	9,314	490	6,114	322
Chinchards	641	34	288	15
Mackerel	533	21	119	4
Tuna and tunalike	2,621	94	2,934	104
Anchovy fillets	2,842	285	2,119	212
Others	164	9	235	12
Total	16,115	933	11,809	669

of the total pack. Substantial increases were noted in 1961 in the packs of anchovy fillets, sardines, and mackerel. There was a decrease of 10 percent in the pack of tuna for the first 6 months of 1961.

During the first half of 1961 sardine landings (for canning and other purposes) in Portugal totaled 20,847 tons. Landings of species used for purposes other than canning were 1,848 tons of anchovies, 705 tons of mackerel, and 828 tons of tuna and bonito. (*Conservas de Peixe*, August 1961.)



South Africa Republic

FISH MEAL MARKET TRENDS, OCTOBER 1961:

After a few very quiet months the South African fish meal market resumed active trading in October 1961. The following prices were obtained from a reliable source in the industry:

In October 1961, 900 long tons were sold to West Germany at a price of US\$126.20 per long ton, c.i.f.

In the same month, 10,000 long tons were sold to the United Kingdom at a price of 15 shillings per protein unit, which works out for 65 percent protein meal to roughly \$135 a long ton, c.i.f. United Kingdom ports, for delivery up to the end of 1961.

In November 1960, it was reported by the South Africa Fishmeal Producers' Association that its representatives had sold £1,000,000 (US\$2.8 million) worth of fish meal to Communist East Germany; the quantity sold was not stated. Later information shows that the sale totaled 50,000 metric tons at £1,750,000 (\$4.9 million), or about \$98 per metric ton.

Although no sale has been concluded with the South Africans yet, it is understood that the East Germans have estimated their 1962 requirements at 100,000 metric tons and that they will buy at least 50,000 tons from South Africa and the rest from Peru. The East Germans prefer the South African product, but the International Fishmeal Exporters' Organization does not favor letting them buy the entire lot from South Africa. It is estimated that a price within the range of \$120-

South Africa Republic (Contd.):

125 per metric ton will probably be finally agreed upon.

Sales were being made early in November 1961 to British buyers for 1962 production on a basis of 15s. 6d. (almost \$2.17) per protein unit; the buyer is guaranteed a minimum of 60 percent protein but payment is made on the actual protein content of the meal as determined by analysis of the shipment.

On the export quota system now in effect, South Africa's basic quota is 160,000 metric tons and all the members of the International Fishmeal Exporters' Organization agreed to export 20 percent less than their quota in 1961. South Africa exceeded her figure of 128,000 metric tons by roughly 10,000 tons and it is still undecided whether this will be debited against her 1962 quota. The 1962 quotas have been set at the base quota minus 15 percent or, for South Africa, 136,000 metric tons.

The domestic price of South African fish meal remains as previously reported: £38 (\$106.40) a short ton.

The bulk of South African fish meal is officially reported to have a digestibility content of 94 percent; a negligible quantity tests out at less than 92.5 percent so that the latter figure could almost be guaranteed. (United States Consulate, Cape Town, report dated November 6, 1961.)



Taiwan

JAPANESE TO CONSTRUCT TWO TUNA LONG-LINERS:

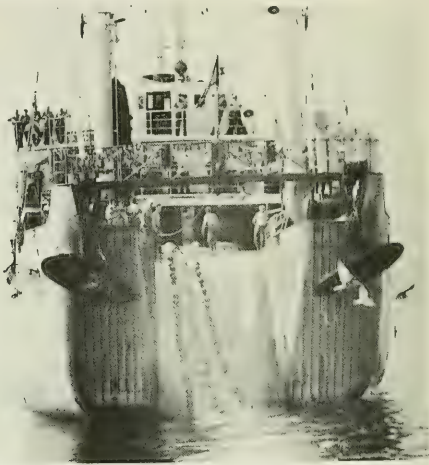
Two 550-ton tuna long-line vessels are scheduled to be constructed at Shimizu, Shizuoka Prefecture, Japan, for a Taiwan fishing company at a cost of 155 million yen (US\$431,000) each. They are expected to be completed about February 1962, and will be based at the north Formosan fishing port of Keelung. The Taiwan fishing company plans to operate the two vessels in the Indian Ocean and hopes to export part of the vessels' catches to the United States. (Suisan Keizai Shim-bun, November 15, 1961.)



U.S.S.R.

FISHING ACTIVITY ON GEORGES BANK:

In early October 1961, 20 Soviet trawlers and 15 drift gill-netters were sighted fishing mainly for herring, on the Northern Edge of Georges Bank. At that time, no United States fishing vessels and only 4 Canadian scallop draggers were present in the area. Later in the month, as many as 75 to 100 Soviet vessels were reported in the vicinity.



Russian "Majakovski"-type stern trawler fishing on the "Northern Edge" of Georges Bank in October 1961. Leading portion of cod end being hauled up the stern ramp of the trawler.

A large Soviet factory-trawler (280 to 350 feet in length) caught approximately 8,000 pounds of fish in two hours of stern trawling. Two types of drift gill-netters (150-200 feet long) were present; some of the larger ones were equipped to trawl over the side during the daylight hours when not gill-netting. Each morning catches were transferred from the drifters to two cargo ships (tenders) anchored nearby.

* * * * *

EMPHASIS IS ON LARGE VESSELS FOR FISHING:

High-seas fleets of motherships, factory-trawlers, and other craft produced over three-fourths of the 1960 Soviet catch.

Fishing vessels now being constructed are large, improved types, such as the Leskov

U. S. S. R.:

and Maiakovski factory-trawlers of 3,600 metric tons displacement, and motherships of up to 19,500 tons. Twenty-three vessels of the Leskov class have been ordered from Gdansk, Poland; this shipyard has delivered 8 vessels of this type. The vessels are equipped with 4 German filleting machines designed to fillet various sizes of fish. With similar equipment, Maiakovski-type vessels are being built at Nikolaev on the Black Sea. Five have been delivered, with the number on order unknown. Both types of stern factory-trawlers are operating in the North Atlantic and in waters off West Africa.

Two classes of motherships are now being constructed in Polish shipyards for the Soviets. The newest displaces 19,500 metric tons and will be able to stay at sea for 75 days. It is designed mainly to support herring operations, but can be diverted to processing groundfish. The vessels have stern ramps similar to whalers or factory-trawlers to bring aboard catches in cod ends left by fishing vessels. The other type of mother-ship displaces 17,000 metric tons and 8 have been delivered from Polish yards with 11 more on order. This ship is manned by a fishing and processing crew of 270.

AUTOMATION FOR FACTORY-TRAWLERS:

At Leningrad, electronic computers have been developed to operate gear, engines, and processing equipment on large Soviet factory-trawlers. The computer, aided by underwater television, will regulate the trawl depending on depth of fish concentrations. A 5,000-ton trawler, equipped with a computer, will require a crew of only 22; it reportedly will be almost five times more efficient than present trawlers and reduce production costs by 70 percent. (The Fishing News, September 29, 1961.)

NEW BREED OF SALMON DEVELOPED:

Fish breeders on the U. S. S. R. island of Sakhalin (north of Japan) reportedly have evolved a new type of salmon from the masu and humpback species. The new breed weighs more than three times its progenitors at any stage of development and grows to a weight of about 10 pounds. The Soviets have done extensive research on the breeding and trans-

planting of Pacific salmon. (World Fishing, October 1961.)



United Kingdom

REPORT OF FISHERIES STUDY GROUP:

In January 1961, the Minister of Agriculture, Fisheries and Food, announced that Fishery Ministers proposed to set up a small study group to consider what grant-aided experimental work should be done to help the British fishing industry to meet the new conditions they would have to face over the coming years. This group held a number of meetings since March 1961, and submitted its first report to Ministers early in November 1961. The group made a preliminary survey of the experimental work which might be desirable in connection with the design of new vessels; conversion of existing vessels; development of freezing at sea; development of new equipment and gear; exploration of new fishing grounds; and exploitation of species of fish not at present consumed in quantity in this country.

The Group thinks that a good deal more experimental work needs to be done on the design of vessels suitable for freezing fish at sea, and that the best method of assistance is for grants to be given in suitable cases, for the building of experimental vessels on the condition that full information is made available to the industry. The White Fish Authority has already recommended and obtained Government approval for one such project, and has other possibilities in mind. The Group also thinks that experimental work should be done on the possibility of converting orthodox distant- or middle-water trawlers for freezing and that this might, in the first instance, be investigated through paper studies commissioned by the White Fish Authority.

The Group also considers that the research work on the development of freezers with improved performance now being done at the Torry Research Station should be accelerated and that the White Fish Authority and the D.S.I.R. should investigate, possibly in conjunction with the aircraft industry, the possibility of developing compact and lighter refrigerating machinery for use in trawlers.

In the field of new equipment and gear the Group selected two matters as the most important for early investigation. The first is further work on fish-working machinery, for gutting and filleting. Much has already been done, but the Group thinks more is required, particularly on machines for use on board ship. The second is investigation of lighter and improved trawling gear which would enable trawlers, particularly in the middle-water fleet, to fish rough grounds now inaccessible to them.

The Group also considered that further exploratory voyages, both by research vessels and by commercial trawlers, to test new grounds were desirable, and have recommended that such voyages should be planned to cover the following areas: an area in the Barents Sea; the Dohrn Bank off east Greenland; the coast of Labrador; and an area off the south-west coast of Norway. In addition, the Group considered that experimental voyages on herring trawling, particularly for middle-water vessels, should be planned. The White Fish Authority and the Herring Industry Board are considering the necessary action on these recommendations.

Finally, the Group surveyed the possibilities of experimental work on the catching and marketing of species of fish not at present consumed in considerable quantities in this country. It considered that some work should be done on ocean perch, both on methods of handling and preparation of the fish on board, and on marketing. It suggested that the Torry Research Station should undertake work on the former, in association with the White Fish Authority.

United Kingdom (Contd.):

ty, and that the Authority should consider the possibility of a pioneer marketing experiment when conclusions had been reached on the best way to present ocean perch to the public.

Some of the projects recommended by the Group will need to be examined by the White Fish Authority and the Herring Industry Board. On the basis of their examinations, the Authority and the Board will submit to the Ministers for approval those projects for which they think satisfactory arrangements can be made.

The Group will continue to meet from time to time to consider the possibility of other experimental work. One particular matter which it proposes to consider at its next meeting is whether further experimental work needs to be done on "expedition fishing" and the transfer of fish at sea.

The Group had the following terms of reference: "To give advice on what grant-aided experimental work is required for the purpose of making available to the white fish industry information primarily needed for the development of distant and middle water fishing, and what priorities should be given to such work." (United States Embassy, London, November 3, 1961.)

* * * * *

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that as a result of changes in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from October 14, 1961, were:

Fishing vessels of not more than 140 feet, new engines, nets and gear: On loans for not more than five years, $6\frac{5}{8}$ percent (decrease $\frac{1}{2}$ percent); for more than five years but not more than 10 years, $6\frac{3}{4}$ percent (decrease $\frac{1}{4}$ percent); for more than 10 years but not more than 15 years, 7 percent (decrease $\frac{1}{8}$ percent); and for more than 15 years but not more than 20 years, $7\frac{1}{8}$ percent (decrease $\frac{1}{8}$ percent).

Processing plants: On loans for not more than 15 years, 8 percent (decrease $\frac{1}{4}$ percent); and for more than 15 years but not more than 20 years, $7\frac{3}{4}$ percent (no change). The rates on advances made before October 14 are unchanged.

On October 30, 1961, another revision was announced by the White Fish Authority.

Vessels not more than 140 feet, for new engines, nets, and gear: Loans not more than five years, $6\frac{1}{2}$ percent, a decrease of $\frac{1}{8}$ percent; more than five years but not more than 10, $6\frac{5}{8}$, a decrease of $\frac{1}{8}$; more than 10 years but not more than 15, $6\frac{3}{4}$, a decrease of $\frac{1}{4}$; more than 15 years but not more than 20, $6\frac{3}{8}$, a decrease of $\frac{1}{4}$.

Processing plant rates remained the same. (The Fishing News, October 27 and November 10, 1961.)

Note: See Commercial Fisheries Review, November 1961 p. 67.



TRANQUILIZER DRUG STIMULATES SHARKS

A skin-diving team fired tranquilizing drugs into sharks off Cronulla, Australia, in an attempt to stun them. Instead, the drugs stimulated the sharks.

A team member said: "It was a disappointing experiment. The drugs we used actually speeded up the sharks."

The shark hunters are experimenting with a variety of drugs in the hope of finding one which will reduce the menace of sharks to underwater fishermen and professional divers. A doctor accompanied them. (IPFC Current Affairs Bulletin, December 1960.)



FEDERAL ACTIONS



Department of the Interior

CONTRACT FOR PROCESSING ALASKA SEAL SKINS TO BE CANCELED:

The Department of the Interior announced on November 30, 1961, that it has advised the Fouke Fur Company of St. Louis, Mo., that the company's contract with the Federal Government for processing and selling Alaska fur seal skins will be terminated on December 31, 1962.

The decision to end the contract stemmed from the company's notice to the Department that it will move its operations from St. Louis to Greenville, S. C., said Administrative Assistant Secretary D. Otis Beasley. Beasley, who met with representatives of the Fouke Fur Company, said its decision to move was announced without consultation or discussion with representatives of the Department of the Interior, although about 50 percent of the firm's business by volume results from the contract with the Government.

Harvesting and processing of fur seals is part of a scientific management program in which the State of Alaska and the natives of the Pribilof Islands, where the animals are taken, are vitally concerned.

Since the signing of the fur-seal treaty in 1911 between the United States, Canada, Japan, and Russia, the United States has been responsible for administering the Alaska fur-seal industry. The scientific management of the fur seals has resulted in an increase from an estimated 125,000 animals to some 1.5 million at present. The program now permits the taking of some 90,000 seal skins annually.

The contract between the fur company and the Government has existed 40 years on a negotiated basis. Contracts have been amended many times during the period. The United States share of the seal skins has been

processed and sold by the Fouke Fur Company under the contract being terminated.



Department of State

AGENCY FOR INTERNATIONAL DEVELOPMENT

NEW GUARANTIES FOR U. S. PRIVATE ENTERPRISE OVERSEAS:

The U. S. State Department's Agency for International Development (AID), announced on October 27, 1961, that the Agency is ready to receive applications for investment guaranties under the program authorized by the Congress. The total amount of guaranties which can be written under the new program is \$240 million of which \$100 million can be used for the new all-risk guaranty program.

The Investment Guaranty Program is one of the elements authorized by the Congress in the Foreign Assistance Act of 1961 to encourage and assist U. S. private enterprise to participate in the economic and social development of friendly less-developed countries and areas.

The Investment Guaranty Program provides protection against risks peculiar to doing business abroad. The three former types of specific risk guaranties against losses resulting from inconvertibility, expropriation, and war are still available. The new program includes also losses resulting from revolution and insurrection. In addition, coverage is now, for the first time, available not only for United States firms but also for dollar investments by wholly-owned foreign subsidiaries of United States companies.

Under the expanded program, the Agency may, in certain instances, write guaranties against all risks. Such guaranties will be at least 50 percent of the dollar investment and

may go as high as 75 percent in some cases.

Specific Risk Guaranty: From the investors' point of view the most important new provisions of the 1961 Act are:

1. Eligibility for such guaranties is extended to investments by wholly-owned foreign subsidiaries of U. S. companies;
2. Protection against loss resulting from revolution or insurrection is authorized;
3. The authority to treat breach of contract by a government as expropriatory is confirmed.
4. Flexibility is authorized in working out arrangements with host governments for institution of the program.

All Risk Guaranty: In addition to the basic, specific risk guaranty authority described above, AID will in those special and specific cases which occupy an agreed, high priority position in the host country's development plan, issue guaranties of not more than 75 percent, more commonly 50 percent, against loss of any dollar investment and against any risk, including normal business-type risks.

Among the criteria which will be taken into account in reviewing a project are:

1. Whether the activity gives reasonable promise of contributing to the development of economic resources or to the increase of production capacities in furthering the purposes of this title;
2. The extent to which the recipient country is showing a responsiveness to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures; and
3. The possible effects upon the United States economy, with special reference to areas of substantial foreign surplus, of the guaranty involved.

It is contemplated that this authority, which is new to the Foreign Aid Program, will be used to guarantee general economic development projects with emphasis on those projects which further social progress and the development of small, independent busi-

ness enterprises. No such guaranty shall exceed \$10 million; the total face amount of guaranties issued under this authority outstanding at any one time shall not exceed \$90 million. No guaranty shall exceed the total value as of the date of the investment made in the project, plus annual earnings or profits on said investment to the extent provided by such guaranties. It should be kept in mind that funds guaranteed under this title shall not be loaned or reloaned at rates of interest excessive or unreasonable for the borrower.

General economic development projects are defined as those projects, agricultural as well as industrial, in which private capital desires to participate which further develop economic resources and productive capacities of less developed friendly countries and areas. Consideration would also be given to projects such as food processing plants, etc.

AID will give consideration to guaranteeing investments which lead to the development of small independent business enterprises. In this connection investors are reminded of the considerable number of development banks in existence in less developed countries which are supported in part by the AID agency, and which are equipped to assist in the financing of deserving small and medium size ventures.

Note: For a detailed description of the guaranties available, general criteria to be utilized in their administration, and procedures for applying for guaranties, write to the Investment Guaranty Division Agency of International Development, U. S. Department of State, Washington 25, D. C.



Eighty-Seventh Congress (First Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



The second session of this Congress convened on January 10, 1962, after this issue went to press.

FISH AND WILDLIFE SERVICE COMMISSIONER: MacIntyre, Pautzke, and Ross Nominations (Hearings before the Committee on Commerce, United States Senate, 87th Congress, 1st Session, on Nominations of Everette MacIntyre, Federal Trade Commission, July 26 and August 1, 1961; Clarence F. Pautzke, Fish and Wildlife Service, June 7, 1961 and Charles R. Ross, Federal Power Commission, September 21, 1961), 31 pp., printed. Includes nomination of Clarence F. Pautzke, Commissioner of U. S. Fish and Wildlife Service, with statements of one of the Washington Senators and the nominee, Mr. Pautzke.

FOREIGN TRADE: On December 4, the Subcommittee on Foreign Economic Policy of the Joint Economic Committee began hearings. In connection with the hearings, reports have been published by the Committee on the following subjects: subjects:

The European Economic Community and the United States, Joint Committee Print (87th Congress, 1st Session, Report by Robert R. Bowie and Theodore Geiger to Subcommittee on Foreign Economic Policy of the Joint Economic Committee, Congress of the United States), 77 pp., printed. This report is an analysis of the implications of European intergration and the Common Market for U. S. policy.

The Task for 1962: A Free World Community, Joint Committee Print (87th Congress, 1st Session, Report by Henry S. Reuss to the Subcommittee on Foreign Economic Policy of the Joint Economic Committee, Congress of the United States), 13 pp., printed. The report covers the three central economic problems of the free world--trade, payments, and aid--and how they may best be solved by sovereign nations working together.

Trade Adjustment in Theory and Practice, Joint Committee Print (87th Congress, 1st Session, Report by Otto R. Reischer to the Subcommittee on Foreign Economic Policy of the Joint Economic Committee, Congress of the United States), 106 pp., printed. This study examines various methods designed to minimize economic dislocations caused by increased competitive imports. Discusses the significance of adjusting to increased competitive imports; economic and public policy aspects of trade adjustment; foreign examples of

readaptation; previous contributions to the discussion of trade adjustment; organizational and administrative aspects of a trade adjustment program; trade adjustment in manufacturing; trade adjustment in agriculture; and trade adjustment in mining.

Trade Restraints in the Western Community With Tariff Comparisons and Selected Statistical Tables Pertinent to Foreign Economic Policy, Joint Committee Print (87th Congress, 1st Session, Report to the Subcommittee on Foreign Economic Policy of the Joint Economic Committee, Congress of the United States), 66 pp., printed. The purpose of this report is to present a variety of available statistical information which may be pertinent to considerations of foreign economic policy. Part I of the report discusses comparisons of restraints on trade and capital investment presently imposed by the countries of the industrialized West, plus Australia, New Zealand, and Japan. Part II presents a compilation of selected statistical tables dealing with the volume of international trade, foreign investment, wage and productivity rates, and similar subjects.

United States Commercial Policy--A Program for the 1960's, Joint Committee Print (87th Congress, 1st Session, Report by Peter B. Kenento to the Subcommittee on Foreign Economic Policy of the Joint Economic Committee, Congress of the United States), 45 pp., printed. This study examines the United States commercial policy background, i. e., the scope of commercial policy; the tacit compromise on trade policy; the deadlock in tariff bargaining; the new challenge to trade policy and the need for radical reform. It also discusses the strategy of trade liberalization; the tactics of trade liberalization; tariffs, wages, and employment; tariffs and the U. S. balance of payments; and other aspects of commercial policy.

PORTLAND HARBOR, MAINE, IMPROVEMENT: H. Doc. 216, Portland Harbor, Maine, Letter from the Chief of Engineers, Department of the Army, Dated April 26, 1961, submitting a report, together with accompanying papers and an illustration, on a review of reports on Portland Harbor, Maine, requested by a resolution of the Committee on Public Works, House of Representatives, adopted August 20, 1957.



FIRST CLAM CANNERY IN UNITED STATES

"Burnham and Morrill are credited with establishing the first clam cannery in the United States in 1878 at Pine Point, Maine. The pack of canned clam products was small for some years as considerable difficulty was experienced with discoloration but production slowly increased when this difficulty was overcome. P. F. Halferty developed a method for canning minced razor clams about 1900, building up a commercial clam canning industry in Oregon, Washington, and Alaska."

--Principles and Methods in the Canning of Fishery Products, Research Report No. 7, p. 4, U. S. Fish and Wildlife Service.

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

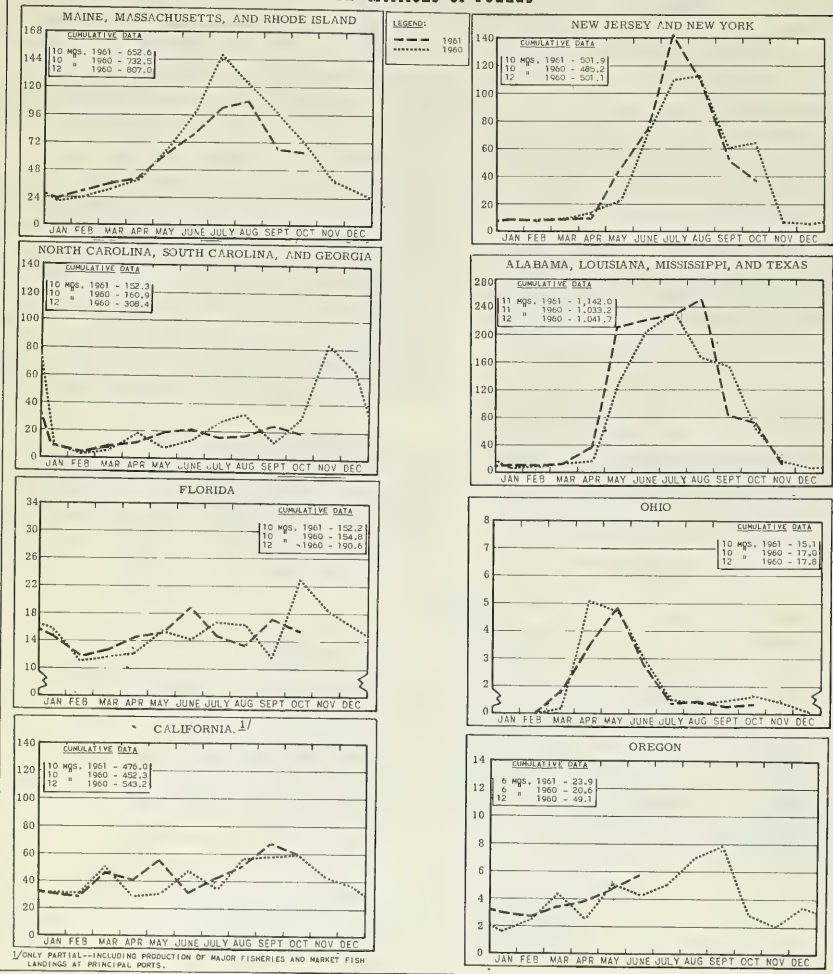
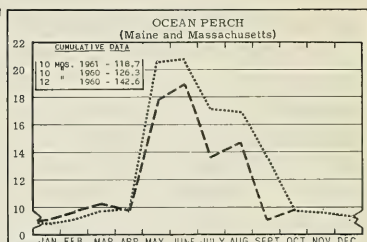
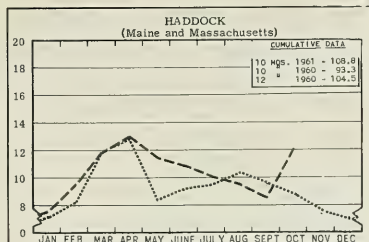
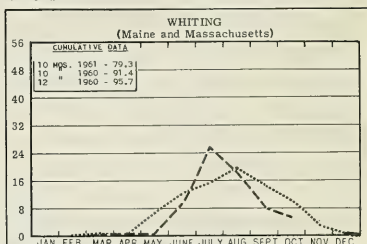
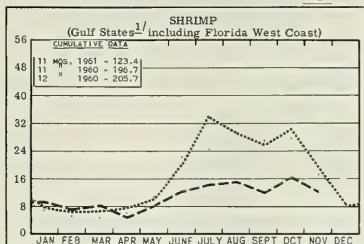


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

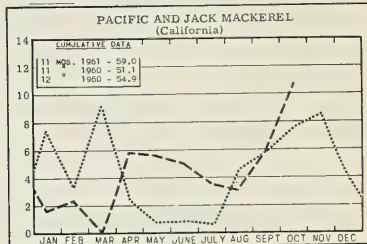
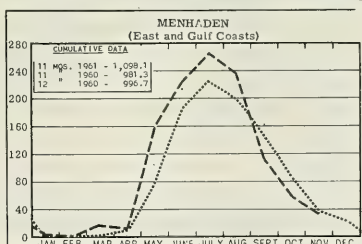


In Millions of Pounds



^{1/}L.A. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

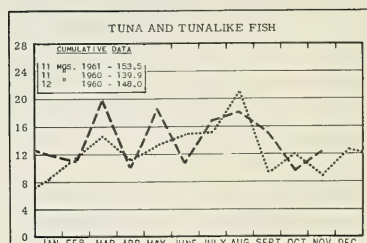
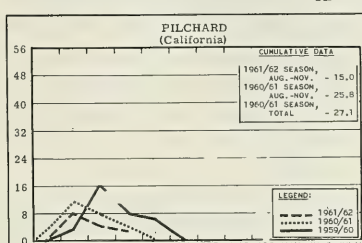
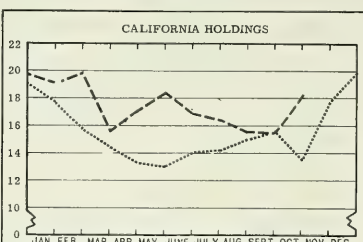
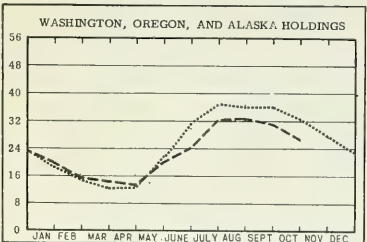
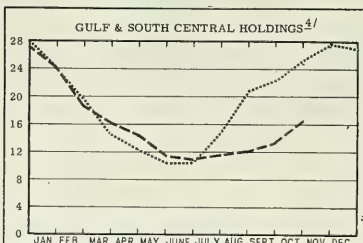
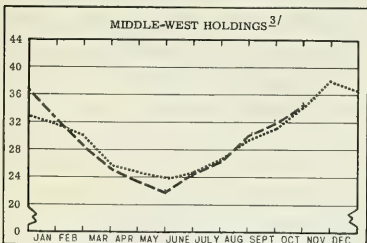
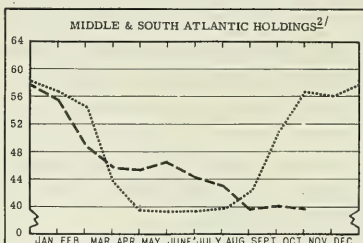
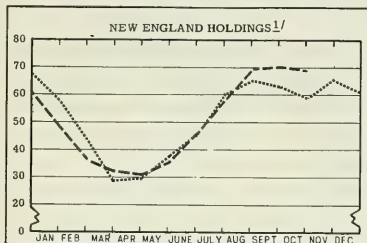
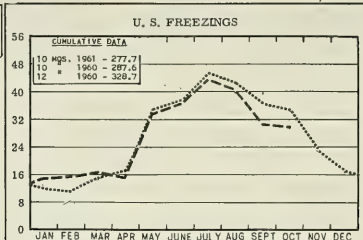
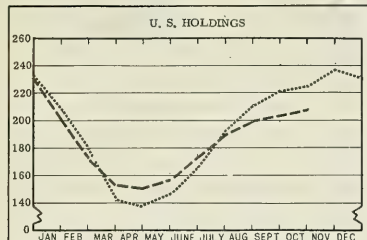


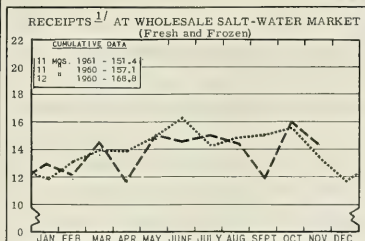
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



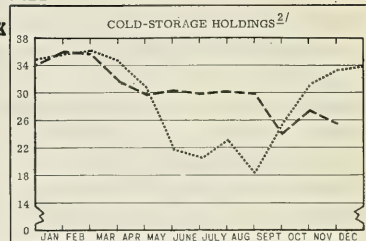
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS In Millions of Pounds

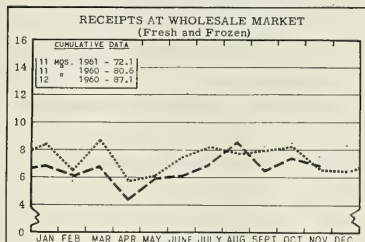


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

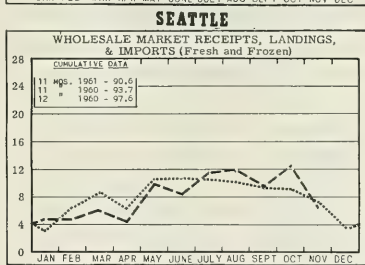
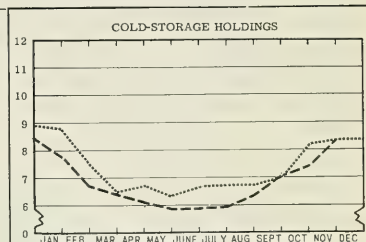
NEW YORK CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
— 1961
--- 1960

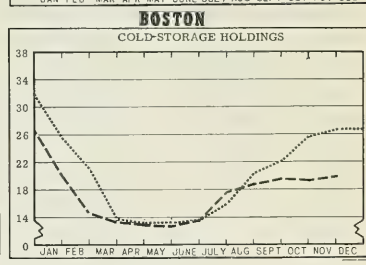


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

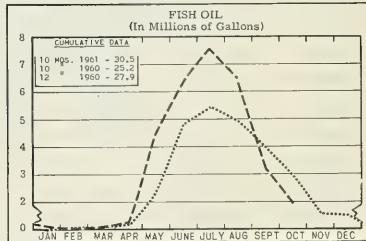
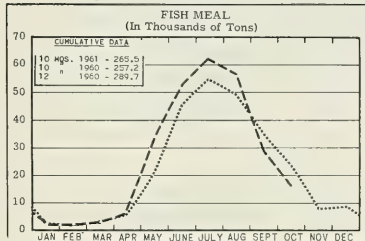
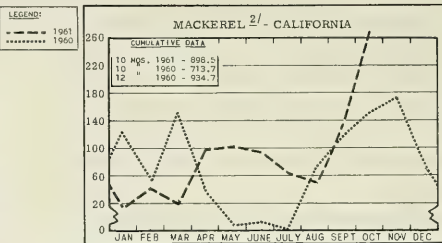
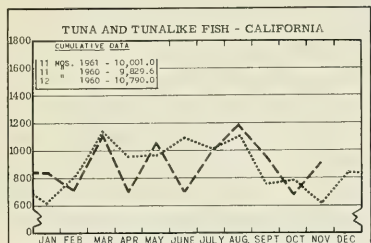
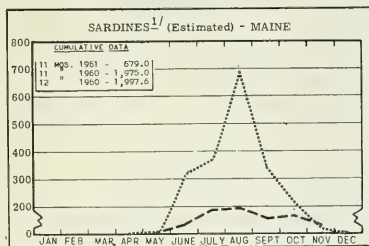
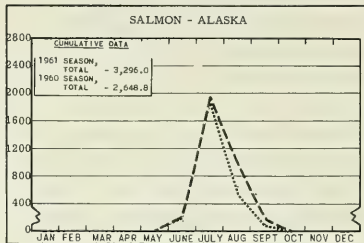
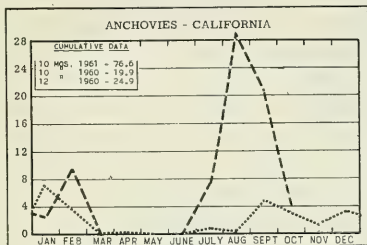


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	$3\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.

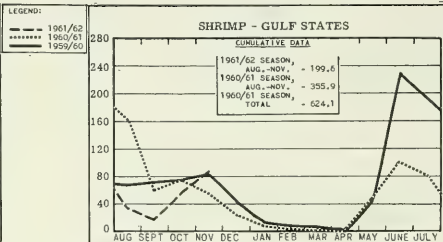
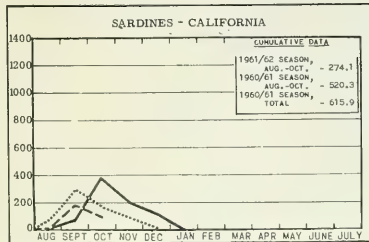
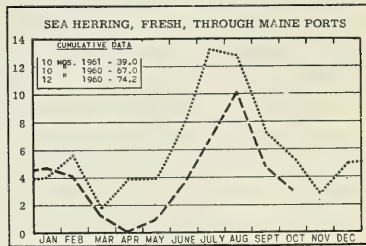
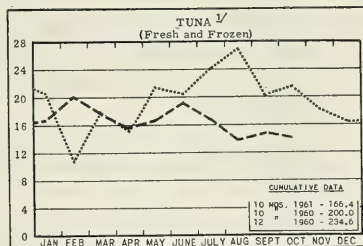
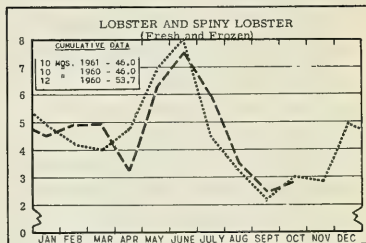
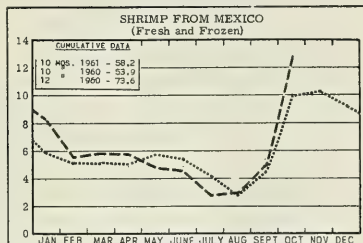
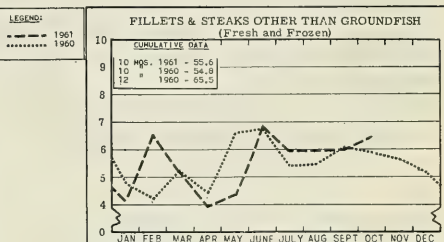
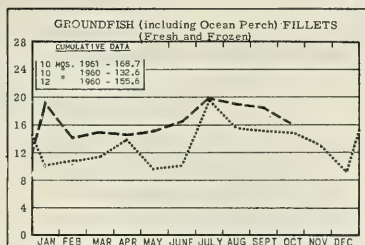
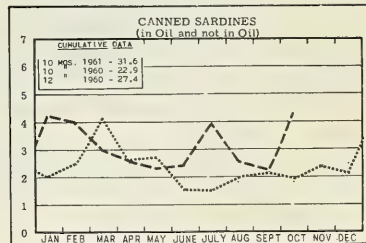
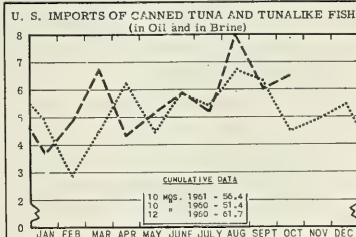


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



1/2 EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE
DIVISION OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHING-
TON 25, D.C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES
REVIEW.

SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND
PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES
(LIMITED DISTRIBUTION).

Number	Title
CFS-2680	- Michigan Landings, July 1961, 3 pp.
CFS-2681	- Wisconsin Landings, July 1961, 2 pp.
CFS-2688	- Massachusetts Landings, June 1961, 5 pp.
CFS-2695	- Shrimp Landings, May 1961, 6 pp.
CFS-2697	- Frozen Fish Report, September 1961, 8 pp.
CFS-2698	- Alabama Landings, May 1961, 3 pp.
CFS-2699	- Georgia Landings, August 1961, 2 pp.
CFS-2700	- South Carolina Landings, August 1961, 2 pp.
CFS-2701	- Fish Meal and Oil, August 1961, 2 pp.
CFS-2702	- Texas Landings, June 1961, 3 pp.
CFS-2703	- Florida Landings, August 1961, 8 pp.
CFS-2704	- Maine Landings, August 1961, 4 pp.
CFS-2705	- Michigan Landings, August 1961, 3 pp.
CFS-2706	- New Jersey Landings, July 1961, 4 pp.
CFS-2707	- New Jersey Landings, August 1961, 4 pp.
CFS-2708	- Wisconsin Landings, August 1961, 2 pp.
CFS-2709	- Shrimp Landings, June 1961, 6 pp.
CFS-2710	- Ohio Landings, August 1961, 2 pp.
CFS-2711	- Maryland Landings, August 1961, 3 pp.
CFS-2712	- Minnesota Landings, August 1961, 2 pp.
CFS-2713	- Virginia Landings, August 1961, 4 pp.
CFS-2714	- California Landings, June 1961, 4 pp.
CFS-2715	- Louisiana Landings, April 1961, 2 pp.
CFS-2716	- Fish Sticks and Portions, July-September 1961, 3 pp.
CFS-2717	- Texas Landings, July 1961, 4 pp.
CFS-2718	- New York Landings, August 1961, 5 pp.
CFS-2719	- Massachusetts Landings, July 1961, 5 pp.
CFS-2720	- Louisiana Landings, May 1961, 2 pp.
CFS-2721	- Texas Landings, August 1961, 3 pp.
CFS-2722	- Rhode Island Landings, August 1961, 4 pp.
CFS-2725	- New Jersey Landings, September 1961, 4 pp.
CFS-2726	- North Carolina Landings, September 1961, 4 pp.
CFS-2727	- South Carolina Landings, September 1961, 2 pp.

Wholesale Dealer in Fishery Products, 1961 (Revised):
SL-3 - Massachusetts, 9 pp.

Firms Canning, 1960 (Revised):
SL-102 - Maine Sardines, 1 p.
SL-102A - Pacific Sardines, 1 p.
SL-103 - Tuna, 2 pp.
SL-103A - Tunalike Fishes, 1 p.
SL-104 - Mackerel, 1 p.
SL-108 - Salmon Eggs for Bait, 1 p.
SL-110 - Oysters, 2 pp.

Firm Manufacturing, 1960 (Revised):
SL-160 - Menhaden Products, 2 pp.

SSR-Fish. No. 378 - Drift Bottle Records for the Gulf
of Maine, Georges Bank and Bay of Fundy, 1956-58,
by Dean F. Bumpus, 129 pp., illus., May 1961.

SSR-Fish. No. 382 - A Modified Beckman Model DU
Spectrophotometer for Seagoing Use, by Robert W.
Holmes and Robert J. Linn, 8 pp., illus., July 1961.

Sep. No. 633 - Aerial Fish Spotting in the United States
Commercial Fisheries.

Sep. No. 634 - Effects of Some Pesticides on Eggs and
Larvae of Oysters (*Crassostrea virginica*) and
Clams (*Venus mercenaria*).

Literature Citations in Publications of the Fish and
Wildlife Service, by Faxon W. Cook, Circular 115,
18 pp., 1961.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE
BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S.
FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-3	- Legislative Actions Affecting Commercial Fisheries, 87th Congress, 1st Session, 1961, 23 pp., processed. A report of con- gressional legislative actions directly or indirectly affecting or of interest to com- mercial fisheries and allied industries.
MNL-48	- Pakistan's Fisheries Statistical Report, 1960, 4 pp.
MNL-61	- Shrimp and Lobster Fisheries of Costa Rica (Survey Period: April 24 to May 6, 1961), 6 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE FROM THE SPECIFIC
OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products,
September 1961, 8 pp. (Market News Service, U. S.

Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, September 1961, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, P. O. Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, September 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port of Galveston and Brownsville, Texas, from Mexico; and longline sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, September 1961, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Receipts of Fresh and Frozen Fishery Products at Baltimore's Wholesale Fish Market, 1960, by James A. Coyne, 60 pp., processed, November 1961. (Available free from the U. S. Fish and Wildlife Service, Market News Service, 103 South Gay Street, Baltimore 2, Md.) The first part of this report is

a summary of receipts of fresh and frozen fishery products on the Baltimore Wholesale Fish Market in 1960, giving comparisons with receipts in 1959. Includes information on crab meat, hard crabs, oysters, striped bass, scup (porgy), hake, whiting, butterfish, shad, spot (lafayette), red hake (ling), fluke, and croaker. Also covers pasteurization of crab meat, Maryland's tidewater fishery laws, and the Maryland 1960 oyster season. The second part of the report covers statistics on receipts of fresh and frozen fishery products, such as species by states and countries; fish and shellfish totals by months, states and countries by species; domestic and imported totals by months; species by months; and states and countries by months. Also covers 1960 price ranges for fresh fish and shellfish, and conversion factors used to convert shellfish to pounds.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1960, by G. A. Albano, 67 pp., processed, November 1961. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) In the analysis of receipts of fishery products at Chicago, the author discusses the drop in 1960 fishery products receipts and carload receipts at Chicago. He also discusses sources of receipts, trends in fishery products transportation, receipts by months, receipts by species and varieties, lake trout and whitefish fishery and receipts, trends in Great Lakes commercial fishery, cold-storage inventories, imports of fresh and frozen fresh-water fish from Canada, imports of and selected frozen fishery products. Also covers trends in frozen halibut marketing, fish sticks and portions, frozen shrimp market trends, shrimp landings and imports, standards for grades of frozen raw headless shrimp, and calico scallop grounds located off Florida Coast. Also included is a table giving the names, classifications, and approximate weights of certain fishery products as used in the Chicago wholesale markets. The second section presents statistical data on fresh and frozen fishery products receipts at Chicago by species and by states and provinces of origin, states and provinces by species, species by months, states and provinces by months, totals by species, and totals by states and provinces. Receipts are tabulated by method of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled in the Chicago market.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASTIDE AVE., TERMINAL ISLAND, CALIF.

The Study on the Color of the Fishing Net. II--Behavior of Fish Schools in the Neighborhood of a Colored Net, by Kenji Kanda, Atsushi Koike, and Mitio Ogura, 5 pp., processed, October 1961. (Translated from Japanese, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 23, no. 10, pp. 617-620, 1953.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, SEATTLE BIOLOGICAL LABORATORY, 2725 MONTLAKE BLVD., SEATTLE 2, WASH.

A New Method of Catching Fish, by N. F. Chernigin, 8 pp., illus., processed, [Translated from Russian

Rybnoe Khoziastvo, vol. 32, no. 2, February 1956, pp. 22-29.)

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Commercial Fishing Gear of the United States, by William H. Dumont and G. T. Sundstrom, Circular 109, 66 pp., illus., processed, 40 cents. A well illustrated publication showing the various types of fishing gear used in harvesting America's five-billion-pound annual fish catch. Containing dozens of easy-to-follow drawings, the booklet should appeal especially to those interested in the development and utilization of fishing gear. The introduction explains that while fishing is an age-old occupation, fishing gear was developed slowly by trial and error. In the past 60 years mechanization and use of more efficient equipment have revolutionized the fishing industry. The change in fishing gear from the simple net to the present huge purse seines which cost as much as \$40,000 is emphasized. The booklet also points out that a million-dollar boat for fish harvesting is not unusual now and that some large English and Soviet factoryships, designed as stern trawlers to fish, process, and freeze the product at sea, cost several million dollars each.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALGAE:

"Adriatic Algae as an Additional Forage," by O. Jurko, article, *Nova Proizvodnja*, vol. 11, no. 6, 1960, pp. 322-325, printed in Serbo-Croatian. *Nova Proizvodnja*, Ljubljana, Yugoslavia.

The Ecology of Marine Plants of Crystal Bay, Florida, by Ronald C. Phillips, contribution no. 51, 10 pp., illus., printed. (Reprinted from *The Quarterly Journal of the Florida Academy of Sciences*, vol. 23, no. 4, pp. 328-337, December 1960.) Florida State Board Conservation Marine Laboratory, Bayboro Harbor, St. Petersburg, Fla.

ANCHOVETAS:

Tagging of Anchovetas (CETENGAULIS MYSTICETUS) in the Gulf of Panama, by Edward F. Klima and William H. Bayliff, 6 pp., illus., printed. (Reprinted from *Proceedings of the Gulf and Caribbean Fisheries Institute*, Thirteenth Annual Session, pp. 151-156, Nov. 1960.) Gulf and Caribbean Fisheries Institute, 1 Rickenbacker Causeway, Virginia Key, Miami, Fla.

BARENTS SEA:

"Causes of Changes in the Fauna and the Biological Productivity of the Barents Sea over a Period of Many Years," by M. M. Kamshilov, article *Trudy Okeanograficheskoi Komissii*, vol. 10, no. 4, 1960, pp. 42-47, printed in Russian. *Trudy Okeanogra-*

ficheskoi Komissii, Akademii Nauk SSSR, Moscow, U. S. S. R.

BENELUX COUNTRIES:

Import Tariff System of Belgium, Netherlands, and Luxembourg, WTIS Part 2, Operations Report No. 61-71, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., October 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

BONEFISH:

A Contribution to the Life History, Biology and Geographical Distribution of the Bonefish, ALBULA VULPES (Linnaeus), by Elizabeth C. Alexander, Dana-Report No. 53, 51 pp., illus., printed, Kr. 15 (about US\$2.20). Andr. Fr. Host & Son, Bredgade 35, Copenhagen K, Denmark, 1961.

BRAZIL:

Import Tariff System of Brazil, WTIS Part 2, Operations Report No. 61-57, 4 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This report presents information on units of currency, weights, and measures; import regulations; bases of specific and ad valorem duties; customs duties and surtaxes; sales and other internal taxes; consular documents and fees; and related subjects.

"Introducao ao Conhecimento da Pesca Maritima no Nordeste Brasileiro" (Introductory Study of the Marine Fishery of Northeast Brazil), by M. P. Paiva, article, *Revista Nacional de Pesca*, vol. 1, no. 5, 1960, pp. 18-20, printed in Portuguese. *Revista Nacional de Pesca*, Sao Paulo, Brazil.

"Sinopse sobre a Pesca Interior no Brasil" (Synopsis of the Fresh-Water Fisheries of Brazil), by M. P. Paiva, article, *Revista Nacional de Pesca*, vol. 1, no. 6, 1960, pp. 41-42, printed in Portuguese. *Revista Nacional de Pesca*, Sao Paulo, Brazil.

CALIFORNIA:

California Cooperative Oceanic Fisheries Investigations, vol. 8, 130 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif., January 1, 1961. This report consists of two sections. The first contains a brief review of the administrative and research activities of the California Cooperative Oceanic Fisheries Investigations during the period July 1, 1959-June 30, 1960, a description of the fisheries, and list of publications arising from the program. The second section is comprised of original scientific contributions which are either the direct results of the research programs, or represent research directly pertinent to resource development in the pelagic realm off California.

California Ocean Fisheries Resources to the Year 1960, 77 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif. A preliminary report of the work of the California Department of Fish and Game in advancing the ability to provide profit from and to preserve the resources of the ocean bordering Californian shores for the benefit of California sport and com-

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mercial fishermen. Concerns itself only with marine resources.

CANADA:

Fisheries Statistics of Canada, 1959 (Canada Summary), 51 pp., printed in French and English, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1961. This report provides a summary of the Canadian fisheries, arranged to show separately the three main fisheries areas--Atlantic, Pacific, and Inland. Also contains statistical tables on catch of fish, products, employment in the primary industry, fishing craft and gear.

Journal of the Fisheries Research Board of Canada, vol. 18, no. 4, 1961, 186 pp., illus., printed, C\$1.50. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, the following articles: "Proximate Composition of Canadian Atlantic Fish. I--Variation in Composition of Different Sections of the Flesh of Atlantic Halibut (*Hippoglossus hippoglossus*); II--Mackerel, Tuna and Swordfish," by A. Mannan, D. I. Fraser, and W. J. Dyer; "The Amino Acid Composition of Cod Tropomyosin," by P. L. Hoogland and others; "Observations on the Ecology of the Pacific Cod (*Gadus macrocephalus*) in Canadian Waters," by K. S. Ketchen; "Two Epidemics of Apparent Kidney Disease in Cultured Pink Salmon (*Oncorhynchus gorbuscha*)," by Gordon R. Bell; "Muscle Proteins of Pacific Salmon (*Oncorhynchus*). I--A Note on the Separation of Muscle Proteins Soluble in Low Ionic Strength Salt Solutions," by H. Tsuyuki and Eve Roberts; and "Temperature and the Biochemical Processes Occurring during Rigor Mortis in Cod Muscle," by Doris I. Fraser, Somsee Punjamapirom, and W. J. Dyer.

CARP:

"Crossbreeding Carps," by I. V. Kiselev, article, Agrobiologiya, no. 2, March-April 1961, pp. 206-216, printed in Russian. Agrobiologiya, Moscow, U.S.S.R.

"Effect of Breeding on Changes in Certain Characteristics of Carp," by V. A. Movchan, article, Agrobiologiya, no. 2, March-April 1961, pp. 217-221, printed in Russian. Agrobiologiya, Moscow, U.S.S.R.

"Results of Raising Wild and Pond Carp Crosses in Ponds Contaminated by Hemorrhagic Septicemia," by I. M. Karpenko and M. S. Sventsits'kiy, article, Visnyk Sil' S'Kohospodar'skoi Nauky, vol. 4, no. 1, January 1961, pp. 116-117, printed in Russian. Visnyk Sil' S'Kohospodar'skoi Nauky, Kiev, U.S.S.R.

"Using Antibiotics for the Prevention and Treatment of Hemorrhagic Septicemia in Carp," by O. K. Shcherbina and others, article, Visnyk Sil' S'Kohospodar'skoi Nauky, vol. 4, no. 2, February 1961, pp. 89-92, printed in Russian. Visnyk Sil' S'Kohospodar'skoi Nauky, Kiev, U.S.S.R.

COALFISH:

"Biology of the Coalfish (*Pollachius virens* L.) in the Barents Sea," by N. V. Mironova, article, Trudy Okeanograficheskoi Komissii, vol. 10, no. 4, 1960, pp. 55-61, printed in Russian. Trudy Okeanograficheskoi Komissii, Akademii Nauk SSSR, Moscow, U.S.S.R.

COMMUNIST CHINA:

Development in the Fishing Industry in Communist China, by Ajia Kenkyu and Ajia Keizai Junpo, JPRS 9817, 49 pp., processed. (Translated from Japanese Ajia Kenkyu, No. 271, June 6, 1961, pp. 2-9; No. 272, June 13, 1961, pp. 7-10). Photocopies of this report may be purchased from: Photoduplication Service, Library of Congress, Washington 25, D. C.

CONCHS:

Studies on the Crown Conch MELONGENA CORONA Gmelin, by Ralph R. Hathaway and K. D. Woodburn, Contribution No. 41, 21 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 11, no. 1, pp. 45-65, March 1961.) Marine Laboratory State Board of Conservation, St. Petersburg, Fla.

CONSERVATION:

Marine Fisheries: Their Conservation and Their Potential, by C. E. Lucas, Marine Reprint, printed. (Reprinted from Advancement of Science 1961.) Marine Laboratory, Department of Fisheries for Scotland, Aberdeen, Scotland, 1961. Describes the sea as the source of valuable marine fisheries. In discussing the conservation and potential of the resource, the author points out that the yield, about 30 million tons of animal protein a year throughout the world, is small in comparison with the yield from agriculture, but it has great potentialities. He thinks it can be doubled by the simple application of present knowledge and techniques, but that further knowledge would open the way to a much larger harvest.

DAMS AND FISHERY RESEARCH:

Progress Report on Fisheries Engineering Research Program, 156 pp., illus., processed. U. S. Army Engineer Division, North Pacific, Corps of Engineers, 210 Custom House, Portland 9, Oreg., July 1960. Contains papers on "Guiding Downstream Migrant Salmon and Steelhead Trout," "Results of a Tagging Program to Enumerate the Numbers and to Determine the Seasonal Occurrence of Anadromous Fish in the Snake River and its Tributaries," "Enumeration Study Upper Columbia and Snake Rivers," "Evaluation of the Ability of an Artificial Outlet to Attract Downstream Migrant Salmonids from the Reservoir of Lookout Point Dam," "The Control of Downstream Migrants by Means of Mechanical Screens," "Fishway Attraction Water Supply Study," "Effect of Structures at Main Columbia River Dams on Downstream Migration of Fingerlings," "The Status of Electrical Fish Guiding Experiments," "Research Relating to McNary Supplemental Spawning Channel," "Research on Fishway Problems," "A Study to Determine the Effects of Electricity on Salmon and Steelhead Trout," "A Study to Investigate the Effects of Fatigue and Current Velocities on Adult Salmon and Steelhead Trout," "Research Relating to Mortality of Downstream Migrant Salmon Passing McNary and Big Cliffs Dams," "Powerhouse Fish Collection System and Transportation Flows, Bonneville Dam," "Submerged Orifice Research Powerhouse Fish Collection System, Bonneville Dam," "Buoyant Submerged Orifice Research," "An Investigation of the Effect of The Dalles Dam upon Migration Rates of Adult Salmonids, 1956 and 1957," "Experimental Studies on the Survival of the Early Stages of Chinook Salmon after Varying Exposures to Upper Lethal Temperatures," and "Fish Passage through Turbines."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

DENMARK:

Fiskeriberetning for Aret 1960 (The Ministry of Fisheries Annual Report for 1960), 135 pp., illus., printed in Danish with English summary. Fiskeriministeriet, 1 Kommission Hos. G.E.C. Gad, Copenhagen, Denmark. A report on the Danish fishing industry during 1960. Includes information and statistical tables on number of fishermen employed, fishing fleet, fishing gear, landings of fish and shellfish. Also contains information on fish farms; production of canned, filleted, and smoked fish; and foreign trade in fishery products.

Journal du Conseil, vol. 26, no. 3, September 1961, 106 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. Includes, among others, these articles: "An Automatic Method of Counting Fish Echoes," by R. B. Mitson and R. J. Wood; "The Effect of Pressure on the Survival and Distribution of Larval and Young Fish," by H. M. Bishai; "Otolith Studies of Southern North Sea Herring," by D. F. S. Raitt; "Some Unusual Otolith Types on the Blodden Ground in 1958 and Their Subsequent Occurrence in the Adult Fisheries," by D. F. S. Raitt; and "The Experimental Modification of Meristic Characters in Herring (*Clupea harengus* L.)," by G. Hempel and J. H. S. Blaxter.

DISTRIBUTION OF FISH:

"Intermittent Distribution of Fishes and Large Fluctuations of the Ocean Level," by G. U. Lundberg, article, Trudy Okeanograficheskoi Komissii, vol. 10, no. 4, 1960, pp. 14-16, printed in Russian. Trudy Okeanograficheskoi Komissii, Akademii Nauk SSSR, Moscow, U.S.S.R.

DOLPHINS:

"Simulated Wave-Riding Dolphins," by Byrne Perry, A. J. Acosta, and Taras Kiceniuk, article, Nature, vol. 192, no. 4798, October 14, 1961, pp. 148-150, illus., printed. St. Martins Press, Inc., 175 Fifth Ave., New York 10, N. Y.

EUROPEAN FREE TRADE ASSOCIATION:

First Annual Report of the European Free Trade Association, for the Period ending 1st July, 1961, 40 pp., printed. European Free Trade Association Information Office, 711 Fourteenth St. NW., Washington 5, D. C.

EXPORTS:

Preparing Shipments to Senegal, WTIS Part 2, Operations Report No. 61-55, 8 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

Brazil, WTIS Part 2, Operations Report No. 61-58, 12 pp., printed, 10 cents, September 1961.

Singapore, WTIS Part 2, Operations Report No. 61-59, 8 pp., printed, 10 cents, September 1961.

Turkey, WTIS Part 2, Operations Report No. 61-51, 8 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

FAROE ISLANDS:

Development of the Faroese Fishing Fleet, Faroe in. Figures no. 15, 6 pp., printed. Faero Amts Sparekasse, Copenhagen, Denmark, September 1961. Reviews developments in the Faroese fishing fleet and summarizes local Government budgets, 1952-1962. It also contains current data on fish production and exports.

FISH BEHAVIOR:

"Role of Sense Organs in the Feeding of *Sargus annularis* L. and Some Characteristics of Its Schooling Behavior," by M. P. Aronov, article, Trudy Sevastopol'skaia Biologicheskaiia Stantsiia, no. 13, 1960, pp. 266-274, printed in Russian. Trudy Sevastopol'skaia Biologicheskaiia Stantsiia, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

"Studying the Adaptive Significance of Schooling Behavior in Fishes," by B. P. Mantefel' and D. V. Radakov, article, Uspekhi Sovremennoi Biologii, vol. 50, no. 3, November-December 1960, pp. 362-379, printed in Russian. Uspekhi Sovremennoi Biologii, Akademii Nauk SSSR, Moscow, U.S.S.R.

FISH CULTURE:

Hodowla Ryb Stawowych (Fish Cultivation in Ponds), by W. Goscinski, 565 pp., illus., printed in Polish. Pod Red. W. Goscinskiego (i) A. Rudnickiego, Panstwowe Wydawn. Rolnicze i Lesne, Warsaw, Poland, 1956.

FISH MEAL:

Fish Meal Boosts Broiler Growth, by Edgar C. Quillin, 3 pp., illus., printed. (Reprinted from the Eastern Feed Merchant, September 1961.) Feed Merchant, Garden State Publishing Co., Garden State Bldg., Sea Isle City, N. J.

FISHERY COOPERATIVES:

Cooperation for Fishermen, by Margaret Digby, 136 pp., illus., printed, 75 cents. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961. A study based on the working papers and proceedings of the Technical Meeting on Fishery Cooperatives, jointly sponsored by FAO and International Labour Office in Naples in May 1959. It deals comprehensively with various aspects of the cooperative organization and management in fisheries. According to the author, "Cooperation among fishermen is today fairly widespread in the leading fishing countries of Europe, in North America, Japan and Australia, but it does not often dominate the industry as farmers' cooperatives frequently dominate agriculture. There are also many countries where it is still virtually unknown." In this study an attempt was made to discover what forms of cooperation have in fact been found applicable to the fishing industry; what conditions have led to their adoption, and thereafter promoted or hindered their success; how in practice each type of organization works and what are its difficulties and opportunities, and what part has been played in cooperative development by government or by deliberate education and leadership from outside the fishing industry.

FISHERY ECONOMICS:

"Economic Problems of the Management of the Pond Fisheries in Poland with Particular Consideration

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of the State Management," by H. Skrobisz, article, *Wies Wszelczesna*, vol. 5, no. 2, February 1961, pp. 86-95, printed in Polish. *Wies Wszelczesna*, "Miesiecznik Ruchu Ludowego, Warsaw, Poland.

'Results of the Cooperative Relations between Individual Fishermen and the Economic Fishing Organizations,' by E. Parun, article, *Morsko Ribarstvo*, vol. 12, no. 10, October 1960, pp. 153-155, printed in Serbo-Croatian. *Morsko Ribarstvo*, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.

FLORIDA:

Summary of Florida Commercial Marine Landings, 1960, and an Analysis of the Catch and Effort of Certain Species, by Albert Rosen and Richard K. Robinson, Marine Fisheries Research No. 61-2, 32 pp., illus., printed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., July 1961. Presents a summary of Florida's commercial landings of marine products for 1960. The fisheries for shrimp, mullet, Spanish mackerel, and other fish and shellfish are covered. Although the 1960 catch represented a decline of about 8 percent, compared with the previous year, the value was 16 percent higher than that of 1959. Includes a number of statistical tables giving data on landings and value of catches by species and by counties during 1960.

FOOD AND AGRICULTURE ORGANIZATION:

Fish, the Great Potential Food Supply, by D. B. Finn, World Food Problems No. 3, 50 pp., illus., printed, 50 cents. Food and Agriculture Organization of the United Nations, Viale della Terme di Caracalla, Rome, Italy, 1960. (For sale in United States by the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y.) Discusses the increasing world catch of fish, problems which hinder and hamper fish production, some examples of work and progress in fisheries, and increasing the supply of fish. According to the author, it is estimated that only a fraction of 1 percent of the food consumed by humans is fish, although the oceans and seas cover more than 70 percent of the earth's surface. This great expanse of water, which is about 90 million square miles, is about as productive as arable land, and it should be possible to obtain increased quantities of food from this source.

Yearbook of Fishery Statistics, 1960 (Production and Fishing Craft), vol. XII, 452 pp., illus., processed in English, French, and Spanish, \$4. Food and Agriculture Organization of the United Nations, Rome, Italy, 1961. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y.) This edition contains fishery statistics on catches, production of preserved and processed commodities, fishing craft, and whaling from all countries. The total nominal catch of fish, crustaceans, mollusks, and other aquatic animals, residues and aquatic plants, except seals and whales, throughout the world in 1960 is estimated at nearly 38 million metric tons, an increase of 6 percent over the nominal catch of 1959, and is again greater than in any other year. New record levels have been set for the output of fish meals and oils and of frozen and canned products, but the production of dried and salted fish has declined.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report on FAO-IPFC Training Centre in Fishery Statistics Held at Bombay, India (February 13-April 30, 1959), by V. G. Panse and K. V. R. Sastry, 157 pp., September 1960.

Report on the Third International Inland Fisheries Training Center, Bogor, Indonesia (October 31-December 10, 1955), by W. H. Schuster, FAO Report No. 489, 38 pp., processed, 1956.

Report to the Government of India on the Pearl and Chank Beds in the Gulf of Mannar, by F. Baschieri-Salvadori, FAO Report No. 1119, 74 pp., illus., May 1960.

The United Arab Republic (Egyptian Region) on the Fishery Investigations on the Nile River, the Lakes and the Pond Farms in Egypt, 1958-59, by Wilhelm F. J. Wunder, FAO Report No. 1243, 35 pp., 1960.

The United Arab Republic (Egypt) on Sample Surveys for Fishery Statistics, by V. G. Panse and K. V. R. Sastry, FAO Report No. 1247, 184 pp., 1960.

La Tunisie sur la Pêche en Tunisie (On the Tunisian Fishery), by M. F. Bourgois, FAO Report No. 1283, 59 pp., 1960.

Libya on Fishery Policy and Administration, by John L. Dibbs, FAO Report No. 1289, 16 pp., 1960.

Ghana on Fish Marketing in Ghana, by John L. Dibbs, FAO Report No. 1300, 90 pp., illus., 1961.

Brazil on the Fisheries of the Amazon Region, by Arno Meschkat, FAO Report No. 1305, 101 pp., illus., December 1960.

The Philippines on the Organization and Operation of the Limnology Project, 1959-1960, by J. S. Dendy and F. F. W. Morawa, FAO Report No. 1319, 27 pp., 1961.

(Second), India on the Pearl and Chank Beds in the Gulf of Mannar, by F. Baschieri-Salvadori, FAO Report No. 1323, 14 pp., February 1961.

India on Fishermen's Training Centres, by Rafael Ruppén, FAO Report No. 1328, 20 pp., 1961.

India on the Improvement of Fishing Techniques in Inland Reservoirs of India, by S. B. Gulbadamov, FAO Report No. 1342, 17 pp., illus., 1961.

Burma on the Development of Food Research and Food Industry in Burma, by H. Wittfogel, FAO Report No. 1378, 34 pp., 1961.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Informe sobre el Centro Latinoamericano de Capacitación en Piscicultura y Pesca Continental Desarrollado Bajo los Auspicios del Gobierno de Colombia y de la Organización de las Naciones Unidas para la Agricultura y la Alimentación en Buga (Colombia), 1 Febrero-12 Marzo 1960 (Report on the Latin American Center for Training in Fish Culture and Inland Fisheries Held Under the Auspices of the Government of Colombia and the Food and Agriculture Organization of the United Nations at Buga, Colombia, February 1-March 12, 1960), by John Greenbank, FAO Report No. 1262, 23 pp., 1960.

FOREIGN TRADE:

Licensing and Exchange Controls--Italy. WTIS Part 2, Operations Report No. 61-62, 4 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

--Sudan, WTIS Part 2, Operations Report No. 61-61, 4 pp., printed, 10 cents.

Market for United States Products in Peru, Supplement No. 1 to Part I of the World Trade Information Service, 62 pp., illus., printed, 40 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This report provides current information of interest to exporters wishing to evaluate the Peruvian market. In Chapter I certain parameters useful in evaluating the scope and nature of the market are discussed. Chapter II deals with the pattern of Peru's trade and the outlook for this market. A detailed analysis of imports by commodity groups is contained in Chapter III. Distribution facilities and services, Government regulations affecting imports, and trade practices are discussed in subsequent chapters of this report.

FRANCE:

"La Communauté Economique Européenne, son Extension et la Pêche Maritime" (The European Economic Community, Its Expansion and the Marine Fisheries), by M. Yence, article, *La Pêche Maritime*, vol. 40, no. 1002, September 1961, pp. 628-629, illus., printed in French. *La Pêche Maritime*, 190, Boulevard Haussman, Paris, France.

"Au Portugal la Pêche a la Sardine est Entrée dans une Phase d'Equilibre Economique" (The Sardine Fishery in Portugal Has Entered Upon a Period of Economic Stability), article, *La Pêche Maritime*, vol. 40, no. 1002, September 1961, pp. 631-633, illus., printed in French. *La Pêche Maritime*, 190, Boulevard Haussman, Paris, France.

"Le Saumon du Pacifique est entre dans l'Atlantique" (Pacific Salmon Has Been Introduced in the Atlantic), article, *La Pêche Maritime*, vol. 40, no. 1002, September 1961, pp. 642-644, illus., printed in French. *La Pêche Maritime*, 190, Boulevard Haussman, Paris, France.

FREEZE-DRYING:

"Accelerated Freeze-Drying of Foods--Some European Advances," by Eittrup Petersen, article,

Frosted Food Field, vol. 33, no. 3, September 1961, pp. 11-13, 41, illus., printed. *Frosted Food Field*, 321 Broadway, New York 7, N. Y. Discusses the freeze-drying process; equipment used in Denmark and Scotland; physical changes taking place in food during processing; and causes of undesirable effects such as toughness and dryness after rehydration, discoloration, off-flavoring, and vitamin loss. "The accelerated freeze-drying which took 17 years to develop can therefore be considered as one of the most promising developments in food preservation and has certainly come to stay," concludes the author.

"Better 'Economic Picture' is Needed to Spur Freeze-Drying, Quartermaster Conference Hears," article, *Frosted Food Field*, vol. 33, no. 4, October 1961, pp. 40, 42-43, printed. *Frosted Food Field*, 321 Broadway, New York, N. Y.

"Latest in Freeze-Drying," by Frank K. Lawler, article *Food Engineering*, vol. 33, no. 11, pp. 35-38, illus., printed. *Food Engineering*, Chestnut & 56th Sts., Philadelphia 39, Pa.

"Take a New Look at Freeze-Drying," by A. N. Lederman and F. H. Lindstrom, article, *Food Engineering*, vol. 33, no. 10, October 1961, pp. 41-45, illus., printed. *Food Engineering*, Chestnut & 56th Sts., Philadelphia 39, Pa. Presents figures and facts showing how and why freeze-drying can be economical. According to the authors, "Freeze-drying is not any more expensive than other methods of food preservation. In many instances it's more economical than freezing when considering final distribution or retailing." An illustration of a typical freeze-drying installation shows the simplicity as well as quantity and type of operation that would be required.

FREEZERSHIP:

"Refrigerator-Freezer Vessel *Tavria*, for Fish," by L. P. Kozrychuk and E. G. Iusupov, article, *Sudostroenie*, vol. 27, no. 3, March 1961, pp. 1-5, printed in Russian. *Sudostroyeniye*, Soviet Ministrov SSSR, Sudpromgiz, Suvarovski, Leningrad S-15, U.S.S.R.

FRESH-WATER FISH:

"Effectiveness of the Reproduction of Fishes and Distribution of Their Young in Gorkiy Reservoir," by L. K. Il'ina, article, *Trudy Instituta Biologii Vodokhraneniia*, no. 3, 1960, pp. 195-201, printed in Russian. *Institut Biologicheskoi Fiziki Vodokhraneniia*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"Growth and Age of the Bream (*Abramis brama* L.), the White Bream (*Blicca bjoerkna* L.), the Roach (*Rutilus rutilus* L.) and the Zobel (*Abramis sapa* Pall.) in Gorkiy Reservoir," by L. K. Il'ina, article, *Trudy Instituta Biologii Vodokhraneniia*, no. 3, 1960, pp. 202-215, printed in Russian. *Institut Biologicheskoi Fiziki Vodokhraneniia*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

GEAR:

"A Mechanical Net-Puller for Skiff Fishing with Gill Nets," by Emil J. Smith, Jr., article, *California Fish and Game*, vol. 47, no. 4, October 1961, pp. 327-333, illus., printed, single copy 75 cents.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

California Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif.

GEORGES BANK:

"The Distribution of Eyed Flounder and Lanternfish Larvae in the Georges Bank Area," by John B. Colton, Jr., article Copeia, 1961, no. 3, pp. 274-279, illus., printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

GERMAN FEDERAL REPUBLIC:

Basic Law on Foreign Trade and Payments of the Federal Republic of Germany, WTIS Economic Report Part I, No. 61-63, 16 pp., printed, 15 cents. U. S. Department of Commerce, Washington, D. C., August 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report on the basic law on foreign trade and payments of the German Federal Republic. According to the report, "The basic principles of the law is the provision that exchanges of goods and services, capital transactions, payments and other economic relations between residents of the Federal Republic of Germany and residents of other countries are basically unrestricted... Insofar as it authorizes restrictive measures, the new law is primarily a consolidation of existing laws and regulations on a new foundation of commercial freedom." An unofficial translation of the law is presented in this report together with a table of contents to facilitate its use.

GERMANY:

Experimentelle Versuche uber di Entstehung der Dotterblasenwassersucht bei Regenbogenforellen (Experiments on the Origin of Dropsy of the Vitelline Sac in the Rainbow Trout), by Wolfgang Putschner, 28 pp., illus., printed in German. Universitat Munchen, Amalienstrasse 85, Munchen 13, Germany, 1958.

GREAT LAKES:

"The Identification of Larval Yellow Perch, *Perca flavescens*, and Walleye, *Stizostedion vitreum*," by Carroll R. Norden, article Copeia, 1961, no. 3, pp. 282-288, illus., printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

HERRING:

"On Fecundity and Larval Abundance of Downs Herring," by J. P. Bridger, Fishery Investigations, Series 2, vol. 23, no. 3, 32 pp., illus., printed, 10s. (about US\$1.40). Her Majesty's Stationery Office, Kingsway, London WC2, England.

"Recent Data on the Distribution of the Herring *Clupea harengus* suworowi Rabinerson in the Barents Sea," by L. V. Shutova-Korzh, article, Doklady Akademii Nauk SSSR, vol. 137, no. 4, April 1961, pp. 954-956, printed in Russian. Doklady Akademii Nauk SSSR, Podsozenski per. 21, Moscow B-64, U.S.S.R.

"Smasilundersokelsene i Nord-Norge 1960/61" (Small Herring Investigation in Northern Norway 1960/61), by Olav Dragesund and Per Hognestad,

article, Fiskets Gang, vol. 47, no. 36, September 7, 1961, pp. 619-624, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

IRAQ:

Import Tariff System of Iraq, WTIS Part 2, Operations Report No. 61-60, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

IRRADIATION:

Radiosterilization of Edible Fish, Mollusks, and Crustaceans (A Literature Search), compiled by Theodore F. Davis, TID-3565, 13 pp., processed, 50 cents. Office of Technical Information, U. S. Atomic Energy Commission, Washington, D. C., August 1961. (For sale by the Office of Technical Services, Department of Commerce, Washington 25, D. C.) Included are 69 selected references to reports and published literature on the feasibility of increasing the storage life of marine foods by irradiation.

ISRAEL:

"Israel Develops Its Fisheries," article, Gospodarka Ryb, vol. 7, no. 6, June 1955, pp. 20-21, printed in Polish. Gospodarka Ryb, Warsaw, Poland.

ITALY:

Statistiche della Pesca e della Caccia, 1960 (Fishing and Hunting Statistics, 1960), 168 pp., illus., printed in Italian. Istituto Centrale di Statistica, Rome, Italy, 1960.

JAPAN:

Import Tariff System of Japan, WTIS Part 2, Operations Report No. 61-64, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

LOBSTER:

"Banding Lobster Claws--A Better Way to Inactivate Them," by D. G. Wilder, article, Trade News, vol. 14, no. 3, September 1961, pp. 8-9, illus., printed. Information and Educational Service, Department of Fisheries, Ottawa, Canada.

MADAGASCAR:

"Les Peches Maritimes a Madagascar" (Ocean Fishing off Madagascar), article, Bulletin d'Information, no. 2, October 1961, pp. 30-38, processed in French. Ministere des Travaux Publics des Transports, de la Construction et des Postes et Telecommunications, Tananarive, Republique Malgache.

NAVIGATION:

"Cromwell Current," by O. L. Mamaev, article, Priroda, vol. 50, no. 2, February 1961, pp. 94-96, printed in Russian. Priroda, Akademiya Nauk SSSR, M. Khariton'yevski per. 4, Moscow, U.S.S.R.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

NETHERLANDS:

Marking and Labeling Requirements of the Netherlands, WTIS Part 2, Operations Report No. 61-56, 4 pp., printed, 10 cents, September 1961. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report on the marking and labeling requirements on certain commodities in the Netherlands. This report contains a list of commodities, including fish and shellfish, and the rules and specific regulations pertaining to the marking of individual commodities.

NORWAY:

"Lofotfiskets Lønnsomhet 1961" (Returns from the Lofotey Fishery 1961), article, *Fiskets Gang*, vol. 47, no. 37, September 14, 1961, pp. 638-643, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

"Rapport om de Norske Fiskeriundersøkelser ved Vest-Grønland i 1960" (Report on the Norwegian Fishery Investigation off West Greenland in 1960), by Erling Bratberg, article, *Fiskets Gang*, vol. 47, no. 34, August 24, 1961, pp. 593-597, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

"Rapport om Tokt med F/F Johan Hjort til Vest-Grønland i April-Mai 1961" (Report on the Trip of the Johan Hjort to West Greenland, April-May 1961), by Erling Bratberg, article, *Fiskets Gang*, vol. 47, no. 35, August 31, 1961, pp. 609-610, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

OCEANOGRAPHY:

"El Nino" Study Based on Analysis of Ocean Surface Temperatures 1935-57, by Jacob Bjerknes, *Bulletin* vol. 5, no. 3, pp. 219-303, printed in English and Spanish. Inter-American Tropical Tuna Commission, c/o Scripps Institution of Oceanography, La Jolla, Calif., 1961.

Oceanografia Rybacka: Przyrodnicze Podstawy Rybolowstwa Morskiego (Fishing Oceanography: the Natural Basis of Sea Fishing), by Kazimierz Demel, 283 pp., illus., printed in Polish. (Napisali) Kazimierz Demel (i) Jozef Kulikowski, Panstwowe Wydawn. Naukowe, Warsaw, Poland, 1955.

Physical Oceanography, by Albert Defant, vol. 1, 745 pp., and vol. 2, 606 pp., printed, £10 10s. (about US\$29). Pergamon Press, 122 E. 55th St., New York 22, N. Y.

"Possibility of Theoretical Calculation of the Vertical Temperature Profile in the Surface Layer of the Sea," by S. A. Kitaigorodskii, article, *Izvestia Akademii Nauk SSSR Seriya Geofizicheskaya*, no. 3, March 1961, pp. 487-494, printed in Russian. Izvestia Akademii Nauk SSSR, Seriya Geofizicheskaya, Moscow, U.S.S.R.

"Use of Aerial Photographic Surveying in Studying Surface Currents of the Sea," by Yu. D. Sharikov and I. A. Cherkasov, article, *Meteorologiya i*

Gidrologiya, no. 3, March 1961, pp. 46-48, printed in Russian. *Meteorologiya i Gidrologiya*, Moscow, U.S.S.R.

OYSTERS:

"Oyster Conditions in 1961... An Unusual Year," by Lyle St. Amant, article, *Louisiana Conservationist*, vol. 13, no. 11, November 1961, pp. 10-11, illus., printed. Louisiana Conservationist, Wild Life & Fisheries Bldg., 400 Royal St., New Orleans 16, La. The author states that "It became evident after considering temperatures and salinities during 1961 that an unusual year has occurred in the normal environment of all of the animals using the shallow bays of the Louisiana coast. Just how much this change has affected the animals is difficult to say with limited data and because other unknown factors may be playing a part in over-all production. Nevertheless, it is certain that these conditions did play a part and possibly a large part in causing the low shrimp production for 1961, and it certainly will affect, to a considerable extent, oyster conditions. Fortunately, in the case of oysters, any adverse effects of 1961 may be more than offset by beneficial effects on the over-all oyster industry." The author points out some expected effects of 1961 ecological conditions on oysters, and discusses oyster breeding and setting, growth and mortality, predation, and disease. He concludes that "if fall and winter conditions return to normal and afford good fattening and growth of planted seed, and if the set in 1961 is not too light to furnish adequate seed in 1962, then 1961 can be looked upon as generally beneficial to the oyster industry."

"The Principles of Water Sterilisation by Ultra-Violet Light, and Their Application in the Purification of Oysters," by P. C. Wood, *Fishery Investigations Series 2*, vol. 23, no. 6, 52 pp., illus., printed, £1 (about US\$2.81). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.

Progress in Rehabilitating Disease Affected Oyster Stocks, by R. E. Drinnan and J. C. Medcof, General Series Circular No. 34, 3 pp., printed. Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, October 1961.

The Purification of Oysters in Installations Using Ultra-Violet Light, Laboratory Leaflet No. 27, printed. Fisheries Laboratory, Burnham, England, August 1961.

Scottish Oyster Investigations, 1946-1958, by R. H. Millar, *Marine Research No. 3*, 76 pp., illus., printed, £1 2s. 6d. (about US\$3.15). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1961. Discusses studies made by the Scottish Marine Biological Association of the European flat oyster, *Ostrea edulis* L. A brief history of the Scottish oyster fishery is given. Evidence shows that oysters were formerly common in many places around the coast. They are now more scarce in most localities than formerly and have disappeared entirely from other areas. Overfishing has probably been the main cause of the decline or local extermination of stocks. Loch Ryan is, however, a favorable site for reviving a profitable fishery, according

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to the author, and recommendations are made to ward this goal. Field experiments on growing and fattening transplanted oysters are described. Studies on breeding in two brackish water lakes are also described.

PACIFIC OCEAN:

"Characteristics of Geographical Zones in the Central Part of the Pacific Ocean," by V. G. Bogorov, article, *Trudy Okeanograficheskoi Komissii*, vol. 10, no. 4, 1960, pp. 3-7, printed in Russian. *Trudy Okeanograficheskoi Komissii*, Akademii Nauk SSSR, Moscow, U.S.S.R.

PARASITES:

"Effect of *Dactylogyrus vasator* Nybelin, 1924 (Monogenea, Dactylogyridae) on the Organism of Carp," by A. V. Uspenskaia, article, *Zoologicheskii Zhurnal*, vol. 40, no. 1, January 1961, pp. 7-12, printed in Russian with English summary. *Redaktsiia Zoologicheskogo Zhurnala*, Podsovenskii per, d. 21, Moscow B-64, U.S.S.R.

PERU:

La Pesca Peruana en 1960 (The Peruvian Fishery in 1960), by Javier Iparraguirre Cortez, 31 pp., illus., printed in Spanish. *Servicio de Pesqueria*, Ministerio de Agricultura, Lima, Peru.

PLANKTON:

An Enlarged Clark-Bumpus Plankton Sampler, by Robert G. Paquette, Eugene L. Scott, and Paul N. Sund, Contribution No. 244, 4 pp., illus., printed. (Reprinted from *Limnology and Oceanography*, vol. 6, no. 2, pp. 230-233, April 1961.) Department of Oceanography, University of Washington, Seattle, Wash.

"High-Speed Plankton Net," by V. A. Iashnov, article, *Zoologicheskii Zhurnal*, vol. 40, no. 1, January 1961, pp. 122-128, printed in Russian with English Summary. *Redaktsiia Zoologicheskogo Zhurnala*, Podsovenskii per, d. 21, Moscow B-64, U.S.S.R.

POISONOUS FISH:

"Fish Poisoning in the Tropical Pacific," by A. H. Banner, article, *South Pacific Bulletin*, vol. 11, no. 4, pp. 18-21, 65, illus., printed. *South Pacific Commission*, Box 5254, G. P. O., Sydney Australia.

POLAND:

Gospodarstwo Rybackie w Zbiornikach Zaporowych (Zarys Projektowania) (Fishery Management in Basins Formed by Dams (Outline for Planning)), by T. Backiel, J. Kossakowski, and A. Rudnicki, 74 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 71-B-1, pp. 65-138, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Polow, Transport i Przetwarzanie Tłokow

Lososi i Troci w Dolnej Wisle na Ustę Słotwie z Dotychczasowych Akcji (Toward the Proper Methods of Catching Salmon and Sea Trout Spawners in the Lower Vistula, Their Transportation and Keeping), by Roman Schoennett and Zygmunt Gesicki, 11 pp., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-

B-2, pp. 269-279, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

"Problems Connected with the Development of the Fishing Economy in the 5-Year Plan," by Z. Grzywaczewski, article, *Bud Okretowe Warszawa*, vol. 6, no. 3, March 1961, pp. 79-80, printed in Polish. *Bud Okretowe Warszawa*, Warsaw, Poland.

Przeplawki Komorowe--Biologiczno-Rybackie Zasady Projektowania (Pool Passes--Biological Foundations for Planning), by Stanislaw Sakowicz and Stanislaw Zarnecki, article, *Roczniki Nauk Rolniczych*, no. 69, series D, 1954, 183 pp., printed in Polish with summary in English. Instytut Rybactwa Srodladowego, Warsaw, Poland.

Resorbcja i Znaki Tarlowe Lusek Troci (SALMO TRUTTA L.) z Wod Polski (Resorption and Spawning Marks in the Scales of *Salmo trutta* L. in Polish Waters), by Tadeusz Backiel and Roman Sych, 40 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-B-2, pp. 119-158, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

"A Sketch of the Development and Activities of the Maritime Institute in the Years 1950-1960," by P. Slomianko, article, *Gospodarka Wodna*, vol. 20, no. 11, November 1960, pp. 490-491, printed in Polish. *Gospodarka Wodna*, Czackiego 3/5, Warsaw, Poland.

Stosunki Narybkowe w Płytych Srodladowiskach Srodkowej Wisly (Fry Relations in Shallow Sectors of the Middle Vistula River), by Tadeusz Backiel, 50 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-B-2, pp. 313-362, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Wzrost i Zrozniciowanie Dlugosci w Populacjach Narybku Karpowatych (The Growth and Differentiation of Length in Cyprinid Fry Populations), by Tadeusz Backiel and Stanislaw Bontemps, 36 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-B-2, pp. 363-398, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Zagadnienia Rybackie Przy Obudowie Potokow Gorskich (Stream Regulation in Relation to Fisheries), by Stanislaw Sakowicz and Stanislaw Zarnecki, 42 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 57, pp. 337-378, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Zapobieganie i Zwalczenie Plesni u Trolakow Troci i Lososi Przy Pomocy Kapieci w Roztworze Zieleni Malachitowej (Combating Fungus in Sea Trout and Salmon Spawners by Means of Bathing in a Solution of Malachite Green), by Stanislaw Sakowicz and Stanislaw Gottwald, 11 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-B-2, pp. 283-293, 1958.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Zarybianie Lososiami i Trociami w Gornej Czesci Systemu Rzecznego Wisly w Latach 1879-1954

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

(Stocking of the Upper Vistula River System with Salmon and Sea Trout Over the Period 1879-1954), by Wladyslaw Kolder, 63 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no. 73-B-2, pp. 215-287, 1958.) Instytut Rybactwa Środlodowego, Warsaw, Poland.

POLLUTION:

"Pollution of Coastal Areas of the Sea and Measures for Sanitary Protection," by K. B. Khaik, article, *Gigiena i Sanitariia*, vol. 25, no. 6, June 1960, pp. 9-15, printed in Russian with English summary. *Gigiena i Sanitariia*, Min. Zdravookhraneniia SSSR, Moscow, U.S.S.R.

Proceedings, The National Conference on Water Pollution, FS 2, 64/3:P94/960, 607 pp., illus., printed, \$2.25. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 1961. Presents the official proceedings of the National Conference on Water Pollution, held in Washington, D. C., December 12-14, 1960. In addition to the reports and discussions on the seriousness of the pollution of the Nation's water courses and the many problems to which this pollution gives rise, this report also presents the recommendations of the Conference for the control of the problem.

PRESERVATION:

Manufacturing Industries, 1959-60--Meat and Fish Preserving, by S. R. Carver, no. 23, 9 pp., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. Contains, among others, tables showing Australia's fish and shellfish pack and imports and exports of fish and shellfish.

PURSE SEINING:

New Methods of Purse Seining for Tuna in the Eastern Pacific Ocean, by Gordon C. Broadhead and Arthur R. Marshall, 7 pp., illus., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Thirteenth Annual Session, pp. 67-73, Nov. 1960.) Gulf and Caribbean Fisheries Institute, 1 Rickenbacker Causeway, Virginia Key, Miami, Fla.

RADIOACTIVITY:

"Radioactive Isotopes and Ionizing Radiations in Marine Biology," by G. G. Polikarpov, article, *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, vol. 13, 1960, pp. 275-292, printed in Russian. *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

SALMON:

Age of Pink Salmon and the Pattern of Their Fluctuations in Abundance, by A. P. Vedenskii, 114 pp., processed, \$1.25. (Translated from Russian, *Izvestiia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii*, vol. 41, pp. 111-195, 1954.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"The Fecundity of Atlantic Salmon (*Salmo salar* Linn.)," by J. A. Pope, D. H. Mills, and W. M. Shearer, *Freshwater and Salmon Fisheries Research* 26, 12 pp., illus., printed, 4s. (56 U. S.

cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.

"Functional Morphology of the Hypothalamic-Hypophyseal Neurosecretory System in Salmonid Fishes at Different Stages of Their Life Cycle," by I. A. Barannikova, article, *Doklady Akademii Nauk SSSR*, vol. 136, no. 3, January 1961, pp. 730-733, printed in Russian. *Doklady Akademii Nauk SSSR*, Podsozenski per. 21, Moscow B-64, U.S.S.R.

"History of Yearling King Salmon Marked and Released at Nimbus Hatchery," by George H. Warner, Donald H. Fry, Jr., and A. Nelson Culver, article, *California Fish and Game*, vol. 47, no. 4, October 1961, pp. 343-355, printed, single copy 75 cents. California Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif.

"The Nez Perce Dam and the Value of a Fishery," by W. R. D. Sewell and M. E. Marts, article, *Land Economics*, vol. 37, no. 3, August 1961, pp. 257-260, printed, \$2. Land Economics, Sterling Hall, University of Wisconsin, Madison 6, Wis. Discusses the economic value of the salmon resources of the Colombia River basin versus the importance of its water power potential. Presents details of the Nez Perce and High Mountain Sheep cases.

(State of Maine) Biennial Report of Atlantic Sea Run Salmon Commission (for Period July 1, 1958-June 30, 1960), 14 pp., illus., printed. Atlantic Sea Run Salmon Commission, Fisheries Bldg., University of Maine, Orono, Me.

SARDINES:

"Distribution and Behavior of Sardines (*Sardinella aurita*) at the Coast of West Africa Depending on Oceanographic Conditions," by A. N. Probatov, article, *Trudy Okeanograficheskoi Komissii*, vol. 10, no. 4, 1960, pp. 68-70, printed in Russian. *Trudy Okeanograficheskoi Komissii*, Akademii Nauk SSSR, Moscow, U.S.S.R.

SEA BREAM:

"Growth of the Sea Bream *Diplodus annularis* (L.) in the Black and Adriatic Seas," by L. P. Salekhova, article, *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, no. 13, 1960, pp. 163-165, printed in Russian. *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

SEALS:

"Autumn and Early Winter Distribution of the Baikal Seal," by V. D. Pastukhov, article, *Izvestiia Sibirskie Otdelenie*, no. 2, 1961, pp. 108-115, printed in Russian. *Izvestiia Sibirskie Otdelenie*, Akademii Nauk SSSR, Novosibirsk, U. S. S. R.

SENEGAL:

"La Pêche Maritime au Senegal" (Marine Fisheries of Senegal), by H. Lovat, article, *La Pêche Maritime*, vol. 40, no. 1003, October 1961, pp. 697-703, illus., printed in French. La Pêche Maritime, 190, Boulevard Haussman, Paris, France.

SHAD:

"A New (Estuarine) Form of Shad of the Dnieper River and Some Problems in the Taxonomy of Shads

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of the Black Sea and the Sea of Azov," by V. I. Vladimirov, article, *Zoologicheskii Zhurnal*, vol. 40, no. 4, April 1961, pp. 547-555, printed in Russian with English summary. Redaktsiia Zoologicheskogo Zhurnala, Podsozenskii per. d.21, Moscow B-64, U.S.S.R.

SHRIMP:

Synoptic Rationale of Existing Florida Shrimp Regulations, by Robert M. Ingle, Contribution No. 48, 6 pp., printed. (Reprinted from *Proceedings of the Gulf and Caribbean Fisheries Institute, Thirteenth Annual Session*, November 1960, pp. 22-27.) Florida State Board of Conservation, Tallahassee, Fla.

SMALL BUSINESS MANAGEMENT:

Business Life Insurance, Management Aids for Small Manufacturers No. 130, 4 pp., processed. Small Business Administration, Washington 25, D. C., October 1961. Business life insurance is life insurance used to protect a business, or the family of a businessman, from the financial loss which results from the death of someone associated with the business. There is no basic difference between business life insurance and the life insurance used for personal and family needs. But the protection set up by a business firm does involve many more complex details to meet legal, financial, tax and technical problems. This report lists the numerous specific purposes for which business life insurance is written, and describes the steps to be taken in the establishment of a business life insurance plan.

Direct Mail Advertising for Small Retailers, by R. M. Lovejoy, *Small Marketers Aid No. 72*, 4 pp., processed. Small Business Administration, Washington 25, D. C., September 1961. Direct mail advertising is similar to other advertising with some distinctive characteristics which can be extremely valuable to small marketers. This report discusses the types of direct mail advertising, dangers to avoid, and various steps to help in writing attractive advertisements.

Personal Factors in Choosing a Site for the Small Manufacturing Plant, by Zenon S. Malinowski and William N. Kinnard, Jr., Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C. The study reported in this summary was undertaken (1) to help the owner-managers of small manufacturing firms recognize and understand the role of both economic and noneconomic factors in the choice of a plant site, and (2) to provide community leaders with information that might prove useful in creating an atmosphere attractive to new small industry. It was concluded that personal considerations play an important part in plant-location decisions, especially in the choice of general area and town or community. In considering a new location, the small manufacturer must distinguish carefully between economic and personal noneconomic factors in order to guard against any tendency to rationalize his personal bias into economic justification.

Selecting a Site for the Small Manufacturing Plant, by James H. Thompson, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C. A summary

of a report on selecting a site for the small manufacturing plant. One of the most common mistakes in the selection of a plant location, according to the report, is insufficient preliminary planning. The research reported in the summary was undertaken to meet the need of small manufacturers for a guide to plant-location methods. The conclusions are based primarily on interviews with 38 firms with a record of successful site selection.

SOUTH ATLANTIC OCEAN:

"Notes on the Fishing Effort Along Parts of the Occidental Shelf of the South Atlantic Ocean," by M. P. Paiva, article, *Boletim de la Sociedade Cearense de la Agronomia*, vol. 1, 1960, pp. 179-186, printed in Portuguese. Boletim de la Sociedade Cearense de la Agronomia, Fortaleza, Ceara, Brazil.

SPINY LOBSTERS:

"Exploracao da Lagosta no Ceara" (Spiny Lobster Exploration in Ceara), by M. P. Paiva, article, *Mundo Agrario*, vol. 7, no. 97, 1959, p. 17, printed in Portuguese. Mundo Agrario, Rio de Janeiro, Brazil.

"Perspectivas da Exploracao Lagosteira no Rio Grande do Norte" (Review of Spiny Lobster Exploration in Rio Grande do Norte), by M. P. Paiva, article, *Mundo Agrario*, vol. 8, no. 101, 1959, p. 20, illus., printed in Portuguese. Mundo Agrario, Rio de Janeiro, Brazil.

"On the Spiny Lobster Fishing in Ceara," by M. P. Paiva, article, *Boletim Antropologia*, vol. 2, no. 1, 1958, pp. 63-70, illus., printed in Portuguese. Associacao Brasileira de Antropologia, Rua da Matriz 92, Botafogo, Rio de Janeiro, Brazil.

SPRAT:

"Age Variations in the Morphology of Sprat (*Sprattus sprattus phalericus* Risso) in the Black Sea and Their Functional Significance," by N. Ia. Lipskaia, article, *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, no. 13, 1960, pp. 180-184, printed in Russian. Trudy Sevastopol'skaia Biologicheskaiia Stantsiia, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

"Diurnal and Seasonal Variations in the Feeding of Sprat (*Sprattus sprattus phalericus* Risso) in the Black Sea," by N. Ia. Lipskaia, article, *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, no. 13, 1960, pp. 190-203, printed in Russian. Trudy Sevastopol'skaia Biologicheskaiia Stantsiia, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

STARFISH:

"Enigma of an Echinoderm," by Allison L. Burnett, article, *Natural History*, vol. 70, no. 9, November 1961, pp. 10-19, illus., printed. The American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. Discusses the complex anatomy of the starfish. Much of the starfish's biology remains a scientific mystery.

STURGEON:

Beluga Chernogo Moria (Beluga of the Black Sea), by A. I. Ambroz, *Uchenye Zapiski*, vol. 56, 199 pp., printed in Russian. Kishinev Universitet, Kishinev, U.S.S.R.

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SWORDFISH:

"Scientists Study the Swordfish," by G. J. Gillespie, article, *Trade News*, vol. 14, no. 3, September 1961, pp. 3-7, illus., printed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. The spectacular growth of the swordfish industry in Nova Scotia--the only province in the Canadian Maritimes where swordfish are hunted--has encouraged further study of the biology and ecology of the swordfish. This article describes some of the work which has been done in this field of research, and discusses the distribution of the swordfish, its behavior, and living habits. The history of fishing for swordfish in the northwest Atlantic is also discussed.

TARIFFS:

Import Tariff System of Paraguay, WTIS Part 2, Operations Report No. 61-63, 2 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

Tariff Classification Study: Alphabetical Index of Commodities Provided for in the Proposed Revised Tariff Schedules of the United States, May 20, 1961, Miscellaneous Series TC, 130 pp., processed, 85 cents. United States Tariff Commission, Washington, D. C., 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This volume contains an alphabetical index of commodities (including fish, shellfish, and fishing equipment) provided for in the "Proposed Revised Tariff Schedules of the United States." The index has been prepared to facilitate reference to the proposed tariff schedules.

TOXICITY:

"Toxicity of Different Poisons Used in Antifouling Paints," by M. A. Dolgopoli'skaia and E. S. Gurevich, article, *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, no. 13, 1960, pp. 315-325, printed in Russian. *Trudy Sevastopol'skaia Biologicheskaiia Stantsiia*, Akademiia Nauk SSSR, Leningrad, U.S.S.R.

TRADE LISTS:

The Bureau of International Business Operations, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 a copy.

Canneries and Frozen Foods--Producers and Exporters--Guatemala, 2 pp. (October 1961). Includes the name and address of one firm in Guatemala which processes and exports frozen shrimp to the United States. The exporting firm reports an average production of about 80,000 pounds of shrimp a month. In 1960 exports of frozen shrimp were valued at \$159,000.

Canneries--Republic of South Africa, 9 pp. (September 1961). Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm.

Canneries and Frozen Foods--Producers and Exporters--Turkey, 4 pp. (August 1961). Lists the names and addresses, size of firms, and types of

products handled by each firm. Includes producers and exporters of canned fish and frozen fish.

TRAPS:

"Trapping Devices as Basic Equipment for Catching First-Class Fish," by W. Korzynek, article *Gospodarka Ryb*, vol. 7, no. 6, June 1955, pp. 18-19, printed in Polish. *Gospodarka Ryb*, Warsaw, Poland.

TRAWLERS:

"The Case for the Stern Ramp," by C. Birkhoff, article, *World Fishing*, vol. 10, no. 10, October 1961, 28-29, 35, illus., printed, 3 s. (about 42 U. S. cents), John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London NW1, England. Discusses the pros and cons of current trends in the gear-hauling arrangements of stern trawlers.

"Trawlers Will Come from the Atlantic Ocean," by V. A. Eroschchev-Shak, article, *Doklady Akademii Nauk SSR*, vol. 137, no. 4, April 1961, pp. 951-953, printed in Russian. *Doklady Akademii Nauk SSR*, Podosenski per. 21, Moscow B-64, U.S.S.R.

TROUT:

An Evaluation of Stocking Hatchery-Reared Steelhead Rainbow Trout (SALMO GAIIRDNERII GAIIRDNERII) in the Sacramento River System, by Richard J. Hallock, William F. Van Woert, and Leo Shapovalov, *Fish Bulletin* No. 114, 75 pp., illus., printed. California Department of Fish and Game, 987 Jedsmith Dr., Sacramento 19, Calif.

Polowy Troci (SALMO TRUTTA L.) w Zatoche Gdanskiej i w Systemie Rzeczynym Wisly (Catches of Sea Trout (Salmo trutta L.) in the Danzig Bay and in the Vistula River System), by Jan Jokiel and Tadeusz Backiel, 16 pp., illus., printed in Polish with summary in English. (Reprinted from *Roczniki Nauk Rolniczych*, no 75-B-2, pp. 213-222, 1960.) Instytut Rybactwa Srodladowego, Warsaw, Poland.

Some Environmental Relations of the Speckled Trout (SALVELINUS FONTINALIS), by F. E. J. Fry, 29 pp., processed. (Reprinted from the *Proceedings of the N. E. Atlantic Fisheries Conference*, May 1951.) Ontario Fisheries Research Laboratory, Department of Zoology, University of Toronto, Toronto, Ontario, Canada.

TUNA:

"A Method of Predicting Tuna Catch by Using Coastal Sea-Surface Temperatures," by Frank J. Hester, article, *California Fish and Game*, vol. 47, no. 4, October 1961, pp. 313-326, illus., printed, single copy 75 cents. California Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif. This study attempts to relate fluctuations in the temperate tuna catch (bluefin and albacore) to environmental conditions as measured by sea-surface temperatures at two shore stations in southern California. In summary, the author states that "(1) Tuna landings from southern California waters fluctuate from year to year both in quantity and area of capture; (2) A correlation has been shown between sea-surface temperature--July, August, and September mean--at two southern California shore stations and bluefin and albacore catch from selected areas; (3) This correlation holds when winter water temperatures are used permitting a forecast of blue-

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fin and albacore catch before the season begins; (4) Equations have been given for predicting any year's bluefin and albacore catch in selected areas and limits of confidence are set; and (5) Landings from the selected areas have been compared with total California landings."

"Notas Biologicas sobre os Atuns" (Biological Notes on Tunas), by M. P. Paiva, article, Mundo Agrario, vol. 7, no. 99, 1959, p. 37, printed in Portuguese. Mundo Agrario, Rio de Janeiro, Brazil.

Tuna Oceanography Programs in the Tropical Central and Eastern Pacific, by Milner B. Schaefer, 4 pp., printed. (Reprinted from California Cooperative Oceanic Fisheries Investigations, vol. 8, pp. 41-44, Jan. 1961.) California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif.

"La Peche du Thon a la Senne Tournante aux Etats-Unis" (The Purse-Seine Tuna Fishery in the United States), by Michel Angot, article, La Peche Maritime, vol. 40, no. 1003, October 1961, pp. 704-715, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

"Ships for Tuna Fishing," by J. Forembiski and B. Pradzynski, article, Bud Okretowe Warszawa, vol. 6, no. 3, March 1961, pp. 90-92, printed in Polish. Bud Okretowe Warszawa, Warsaw, Poland.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 9, no. 7, September-October 1961, 32 pp., illus., printed in Turkish with English table of contents. Balik ve Balikcilik, Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes the following articles, "The General Conditions of the Black Sea Fishery," by Sebahattin Sehri; "Turkish Lakes in Respect of Fishery," by M. Ilham Artuz; and "Blue Fish," by Sitki Uner.

TURTLES:

"La Tortuga Verde o 'Jaco'" (The Green Turtle or "Jaco"), by Federico Gomez de la Maza, article, Mar y Pesca, vol. 4, nos. 3-4, January-February 1961, pp. 8-10, 56, illus., printed in Spanish, 20 centavos (20 U. S. cents). Departamento de Pesca Edificio I.N.R.A., Onceno Piso, Plaza Civica, Havana, Cuba.

ULTRASONIC DETECTION:

"Application and Principle of the Work of Ultrasonic Detection in Oceanographic and Biological Research," by S. Alfirevic, article, Morsko Ribarstvo, vol. 12, no. 10, October 1960, pp. 159-163, printed in Serbo-Croatian. Morsko Ribarstvo, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.

UNITED STATES PORTS:

Distances between United States Ports, Third (July 1, 1961) Edition, 43 pp., printed, 25 cents. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C., 1961. This report is a by-product of the United States Coast Pilots and assembles under one cover the distance tables computed for the eight books. Each distance is by shortest route that safe navigation permits between the two ports concerned.

U. S. S. R.:

Acclimatization of Fish and Food Organisms in Seas of U. S. S. R., by A. F. Karpevich and others, OTS-61-23555, 227 pp., illus., printed. (Xerox reproduction, \$15.50, for sale by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.)

K. Biologii Lobana u Beregov Gruzii (Biology of the Striped Mullet Along the Georgian Coast), by D. Kh. Meskhidze, 82 pp., printed in Russian. Gosplanie Izdatel'stvo, Batumi, U. S. S. R., 1960.

Iz Istarii Nauchno-Promyslovyykh Ikhtologicheskikh Issledovaniy na Morskikh i Presnykh Vodocemakh SSSR (From the History of Scientific-Ichthyological Fishery Research in the Seas and Fresh-Water Bodies of the U. S. S. R.), by P. G. Borisov, 196 pp., printed in Russian. "Vysshaya Shkola." Gosplanie Izdatel'stvo, Moscow, U. S. S. R., 1960.

Shortcomings in the Fish Industry of the Kaliningradskiy Sovmarkhoz, by I. G. Shapiro, JPRS 9712, 8 pp., processed. (Translated from Russian Rybnoe Khoz-yaistvo, no. 2, 1961, pp. 73-77.) Photocopies of this report may be purchased from: Photoduplication Service, Library of Congress, Washington 25, D. C.

VESSELS:

"Experience in Fishing Boatbuilding Applicable to the IPFC Region," by Jan-Olaf Traung, article, IPFC Current Affairs Bulletin, no. 30, April 1961, pp. 1-30, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand. Discusses the application of naval architecture to small fishing boat construction. Since the layout of a boat, general arrangement of the wheelhouse and engine, fuel tanks and fish hold, depend on the actual fishing method, suggestions are made regarding trawlers, long-liners, purse seiners, and gill-netters. Mechanization of fishing gear is as important as motorization of the craft, according to the author. On small open boats, ice boxes appear to be an economical method of stowing the catch. With modern improvements, small steel boats have been found to be cheaper than wooden ones in many parts of the world. When ordering a boat, a buyer should consider the following--fishing conditions, operational information, economic factors, and construction considerations. The importance of drawings is stressed and suggestions as to boat design are given.

"Marine Fouling," by N. I. Tarasov, article, Zoologicheskii Zhurnal, vol. 40, no. 4, April 1961, pp. 477-489, printed in Russian with English summary. Redaktsiya Zoologicheskogo Zhurnala, Podmosenskiy per. d.21, Moscow B-64, U. S. S. R.

VIETNAM:

A Check List of Fishes of Vietnam, by Katsuzo Kuroshima, 74 pp., printed. Division of Agriculture and Natural Resources, United States Operations Mission to Vietnam, Saigon, Vietnam, January 1961. Listed are 807 fish species in 411 genera and 139 families with their scientific classification, and where known, their Vietnamese, Japanese, and English names. Provides a handy reference to aid in the study of fish fauna of Vietnam, and also a means to identify the species of fish which are known only by local Vietnamese names.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

WALRUS:

"Among the Walruses," by V. M. Bel'kovich and A. V. Iablokov, article, *Priroda*, vol. 50, no. 3, March 1961, pp. 50-56, printed in Russian. *Priroda*, Akademii Nauk SSR, M. Khariton'yevskii per.4, Moscow, U. S. S. R.

WEST AFRICA:

"The Organization of Fishing in the Waters of West Africa, by Z. Czerninski, article, *Zycie Gospodarcze*, vol. 16, no. 15, April 1961, p. 6, printed in Polish. *Zycie Gospodarcze*, Warsaw, Poland.

WHALING:

"Industria Baleeira nos Acores e Madeira Determinantes do seu Progresso" (Trends in the Whaling Industry of the Azores and Madeira), by Joao Burnay Carvalhais, article, *Boletim da Pesca*, vol. 13, no. 72, pp. 13-24, printed in Portuguese. *Boletim da Pesca*, Gabinete de Estudos das Pescas, 644 R. S. Bento, Lisbon, Portugal.

"Whaling Operations in the Antarctic in the Season 1960/61," article, *Norsk Hvalfangst-Tidende* (Norwegian Whaling Gazette), vol. 50, no. 9, September 1961, pp. 355-372, 375-376, 379, illus., printed in Norwegian and English. *Norsk Hvalfangst-Tidende*, Sandefjord, Norway. A survey of the whaling operations in the Antarctic in the season 1960/61 prepared for and submitted at the meeting of the International Whaling Commission in London in June 1961. It covers the most important regulations in the International Whaling Convention for the countries operating in the Antarctic in the 1960/61 season; the number of factoryships and catching boats engaged in pelagic whaling since the 1945/46 season, and their average gross tonnage; and the periods of operation for the various groups of expeditions. Includes statistical data on the catch and oil production of the individual expeditions, and other data on pelagic whaling in the Antarctic in the 1960/61 season.

WOLFISH:

"Dates of the Change of Teeth in Atlantic Wolf Fishes (Anarhichadidae)," by V. V. Barsukov, article, *Zoologicheski Zhurnal*, vol. 40, no. 3, March 1961, pp. 462-465, printed in Russian with English summary. *Redaktsiia Zoologicheskogo Zhurnala*, Podsozenskii per.4,21, Moscow B-64, U. S. S. R.

YUGOSLAVIA:

"Development of Fisheries at Losinj Island, from Their Beginning to the Present Time," by N. Pincic, article, *Morsko Ribarstvo*, vol. 12, no. 10, October 1960, p. 166, printed in Serbo-Croatian. *Morsko Ribarstvo*, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.

"Development of the Yugoslav Shellfish Fisheries," by V. Krizanic, article, *Morsko Ribarstvo*, vol. 12, no. 10, October 1960, pp. 155-156, printed in Serbo-Croatian. *Morsko Ribarstvo*, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.

"Fisheries of Zadar," by J. Basioli, article, *Morsko Ribarstvo*, vol. 12, no. 10, October 1960, pp. 164-165, printed in Serbo-Croatian. *Morsko Ribarstvo*, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.

"Problems of Sea Fisheries," by M. Maric, article, *Nova Trgovina*, vol. 14, no. 1, January 1961, pp. 26-28, printed in Serbo-Croatian. *Nova Trgovina*, Belgrade, Yugoslavia.

"Study of the Improvement of Fishery Cadres," by I. Blagalic, article, *Morsko Ribarstvo*, vol. 12, No. 10, October 1960, pp. 156-157, printed in Serbo-Croatian. *Morsko Ribarstvo*, Association of Marine Fisheries in Yugoslavia, 3 V. Bagota, Rijeka, Yugoslavia.



HOW FISH ARE SMOKED

The smoking process of fish involves the combination of salting and drying, and the characteristic smoke flavor depends upon the degree to which either of these processes is used. Smoking is employed largely for the preservation of herrings, but whiting, cod, king, haddock, catfish, and mackerel are also preserved in this manner. Both hot and cold curing are used. Of the two the hot smoking process imparts better preservative qualities. The type of wood used for the hot smoke is of special importance. Hard woods with less oil and resins which might taint the fish are preferred. (Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.)

TANGY SEAFOOD CANAPES



1 cup flaked or canned fish, crab meat,
lobster meat, or shrimp
3 tablespoons mayonnaise or salad
dressing

1 tablespoon finely chopped celery
 $\frac{1}{2}$ cup butter or margarine
3 tablespoons horse-radish
32 toast points

Chopped parsley

Drain canned fish or remove any shell or cartilage from shellfish. Combine mayonnaise, celery, and fish; blend into a paste. Combine butter and horse-radish. Spread horse-radish butter on toast points. Top with fish mixture. Garnish with parsley sprinkled over the top. Makes about 32 canapes.

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A4463X Fishes

COMMERCIAL FISHERIES'S REVIEW



VOL. 24, NO. 2

FEBRUARY 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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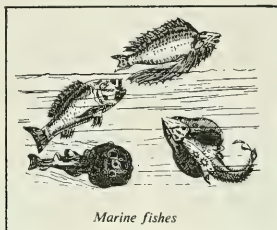
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BLUEFIN TUNA CONCENTRATION FOUND DURING A LONG-LINE EXPLORATION OF THE NORTHWESTERN ATLANTIC SLOPE^{1/}

By Frank J. Mather III* and Martin R. Bartlett*

ABSTRACT

Fourteen exploratory long-line sets (totaling 5,220 hooks) were made in November 1960 in or near the slope water between Cape Hatteras, North Carolina, and the Nova Scotia Banks. This area had not previously been explored for large pelagic fish in that season. Tunas caught included 355 bluefin tuna (*Thunnus thynnus*) and 33 of other species (23 albacore, *T. alalunga*, 3 yellowfin tuna, *T. albacares*, 1 blackfin tuna, *T. atlanticus*, and 6 big-eyed tuna, *T. obesus*). Other fish taken were 2 swordfish (*Xiphias gladius*), 1 opah (*Lampris regius*), 34 lancetfish (*Alepisaurus ferox* and *A. brevirostris*), and 133 sharks (44 blue shark *Prionace glauca*, 2 mako *Isurus oxyrinchus*, 75 porbeagle *Lamna nasus*, 8 silky shark, *Carcharhinus floridanus* (or sickle shark, *C. falciformis*), and 4 hammerhead shark *Sphyrna* sp. or spp.). Most of the bluefin tuna were taken at 4 localities along the 1,000-fathom curve from Hudson Canyon (39°16' N., 71°53' W.) to Lydonia Canyon (40°03' N., 67°37' W.). The catch rates of from 9 to 58 tuna per 100 hooks at those stations indicated an exceptionally dense concentration, while no more than 2 tuna were taken per 100 hooks at any of the other stations. Bathythermograms, surface salinities, and other environmental data were taken at each station.

INTRODUCTION

The objective of cruise 56 of R/V Crawford in November 1960, was to determine, by long-line fishing, the distribution of tuna and other large fish in the waters between the 100-fathom curve and the Gulf Stream, from Cape Hatteras to the Nova Scotia Banks. This information was needed for a continuing study of the biology of the larger pelagic fish of the western North Atlantic in general, and of the bluefin tuna (*Thunnus thynnus*) in particular. The trip also provided a continuation of the long-line exploration of that area by the M/V Delaware of the U. S. Bureau of Commercial Fisheries (Squire, in press).

The Delaware surveys have covered much of the northwestern Atlantic, usually including all or most of the above area and often extending much farther to the south and east, in mid-winter (Cruise 59-1, Anonymous 1959a), during the late winter, spring, and early summer (cruises 57-3, 57-5, 58-2, 59-6, and 60-6, Anonymous 1957a, 1957b, 1958b, 1959b, and 1960b), and also during the summer and early fall (cruises 57-8, 58-3, Anonymous 1958a and 1958c). No observations were

* Woods Hole Oceanographic Institution, Woods Hole, Mass.

^{1/}Contribution number 1187 from the Woods Hole Oceanographic Institution, Woods Hole, Mass. Investigations were supported in part by National Science Foundation Grants G8339 and G6172.



Fig. 1 - R/V Crawford at sea. The 125-foot former Coast Guard cutter (which made 8 transatlantic hydrographic sections during the International Geophysical Year and has been used mainly for hydrographic and productivity studies) by late 1961 had completed 2 major exploratory fishing cruises in the western North Atlantic.

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SEP. NO. 639

made, however, between mid-October and mid-January. Those explorations showed that, from January well into June, bluefin tuna were present in the region mainly north of 36°30' N. and east of 70° W. Most of those taken were of medium size, weighing from 60 to 275 pounds, except in June, when several very large individuals were caught. During the summer and early fall, however, bluefin tuna catches were limited to a very few fish taken near the 1,000-fathom curve. This suggests strongly that in June and early July nearly all of them move on to the continental shelf between Cape Hatteras and Newfound land, where they are found in numbers from mid-June to mid-October (Murray 1952, 1953, 1954, Squire 1959). The Delaware surveys showed, moreover, that yellowfin tuna (T. albacares) were present in the warmer waters of the area through much of the year, moving into the slope water as it warms up in the summer and out of it as it cools in the fall, and that the albacore (T. alalunga) and the big-eyed tuna (T. obesus) occurred in small numbers over much of the area through most of the year.

A similar program of exploratory long-line fishing by the M/V Oregon of the U. S. Bureau of Commercial Fisheries covered much of the Gulf of Mexico throughout the year (Bullis and Captiva 1955, Wathne 1959, and Anonymous 1960a). Those surveys and some commercial fishing (Harvey R. Bullis, Jr., personal communication) revealed the presence of giant bluefin tuna in the Gulf of Mexico from January into June, and in the northwestern Caribbean

(Bullis and Mather 1956) in April, but none were taken during the summer or fall. Likewise, extensive investigations of the inshore sport and commercial fisheries have produced very few positive records of the species for November or December.



Fig. 2 - Setting long-line fishing gear from R/V Crawford. The men handle the main and branch lines, tie the tubs of line together, attach the floats and float lines, and bait the hooks. A typical setting and recovery of a seven-mile line of 500 hooks commences at dawn and takes approximately ten hours.

tents. In addition, we intended to gather as much environmental data as possible. The original plan called for a set of stations along the 1,000-fathom curve, another set just north of or in the Gulf Stream, and a third between the two.

METHODS AND EQUIPMENT

Fishing was conducted with standard 10-hook basket nylon long-line gear (Bullis and Captiva 1955) loaned to us, along with a hauler and other equipment, by the U. S. Bureau of Commercial Fisheries, Gloucester, Mass. Atlantic herring (Clupea harengus harengus), most of which was also furnished by the U. S. Bureau of Commercial Fisheries, was used almost exclusively for bait. Thirty to 50 baskets were usually set at each station, although at 2 only 20 and 17 baskets, respectively, were fished. Most of the float lines were from 10 to 18 fathoms long, allowing the hooks to fish from about 15 to 60 fathoms below the surface. On several sets, a few 30-fathom float lines were used, and they were attached at alternate rather than consecutive connections between baskets, permitting some hooks to fish at depths

Crawford Cruise 56 was designed to fill the seasonal gap in the Delaware program, and especially to determine the whereabouts of the bluefin tuna in November and to learn as much as possible about its migratory routes from its summer grounds on the continental shelf to its extensive wintering areas. Secondary objectives were to mark as many tunas as possible as part of a continuing gamefish tagging program (Mather 1960), and to obtain material for general biological studies, including meristics and morphometrics, length frequencies, seasonal variations of body proportions and gonad condition, and stomach con-

perhaps exceeding 100 fathoms. The bait from each day's fishing was usually saved and used to chum the line on the following day. Plankton was gathered at the level of the shallower hooks by fastening a 1-meter No. 2 mesh ring net to the windward end of the line, suspended by a 15-fathom float line. This arrangement, which was first used by Francis Captiva of the U. S. Bureau of Commercial Fisheries aboard the *Oregon*, not only collects plankton in an undamaged condition but also keeps the windward end of the line straight. Long-line fishing was supplemented by trolling feather and nylon lures on heavy hand lines during the daylight hours as circumstances permitted. In addition to the usual meteorological observations, bathythermograms and salinity samples were taken at least once at each end of the line, the water transparency was measured with a Secchi disk, and subsurface scattering layers were investigated with a precision graphical recorder.

OPERATIONS

Fourteen long-line sets (totaling 5,220 hooks) made between Cape Hatteras and the Nova Scotia Banks (fig. 3) produced 382 tuna and about 165 other fish (table 1). Over 200 of the tuna, mostly bluefin, were marked with dart tags (Mather 1960). The very heavy catches of bluefin tuna at stations 1 and 6 and the very poor results further south at stations 2-5, and

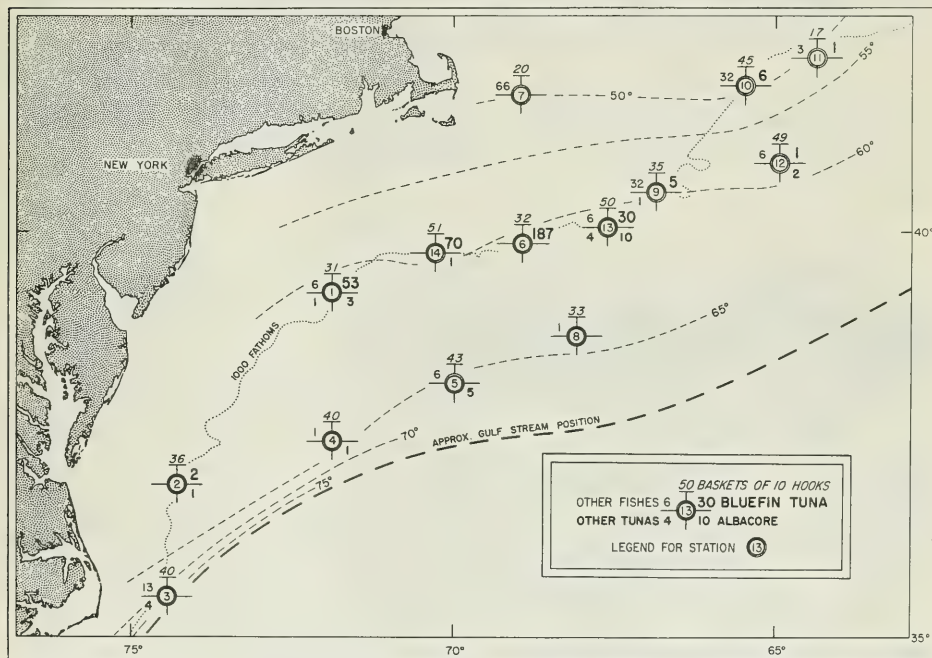


Fig. 3 - Locations of long-line stations occupied during R/V *Crawford* cruise 56, with the number of 10-hook baskets set and the catches of bluefin tuna, albacore, other tuna, and fish of other species for each. Isotherms (°F.) are based on the means of observation at stations only. More detailed environmental and other data are available at the Woods Hole Oceanographic Institution.

later, at station 8, led to a revision of the original plan. Some of the proposed offshore stations were omitted to permit a more extensive search along the 1,000-fathom curve, and also making a set in the northern end of Great South Channel (station 7) to determine whether the bluefin tuna had actually left this well known (Murray 1952, 1953, 1954) summer and early

Table 1 - Station Data and Catches for R/V Crawford Cruise 56, November 1960
(Temperatures, salinities and depths are mean values for each station. All fish brought alongside and identified are listed.)

Sta. No.	Date Nov.	Lat.	Long.	No. of Hooks	Bluefin Tuna	Other Tuna	Misc. Fish	Sharks	Temp.		Surf. Sal. ‰	Depth in Fathoms
									Surf.	180 Feet		
1	12	39°16'	71°53'	310	53	3A 1BE	2LL	2B 2H	62.0	60.6	34.55	1,000
2	13	36°56'	74°18'	360	2	1A			63.9	63.3	34.99	1,000
3	14	35°31'	74°22'	400		3YF 1BK		4B 8S 1H	75.1	74.4	36.22	1,200
4	15	37°28'	71°53'	400		1A	1SL		63.1	62.9	34.91	1,700
5	16	38°11'	69°59'	430		5A	3LL	2M 1H	66.0	64.6	35.28	1,940
6	17	39°52'	68°56'	320	@187				62.3	63.2	34.09	900
7	18	41°37'	68°58'	200				1E@65 P	50.7	49.2	34.35	80
8	21	38°45'	68°05'	330				1B	61.7	63.4	34.59	2,030
9	22	40°28'	66°51'	350	5	1BE	1LL	31B	58.7	59.7	34.31	1,000
10	23	41°43'	65°28'	450	6		1S 20LL	1B 10 P	49.1	45.5	32.40	1,000
11	24	42°03'	64°21'	170	1		2LL	1B	51.2	51.6	32.09	1,225
12	25	40°49'	64°57'	490	1	2A	3LL 1SL	2B	57.7	61.6	34.26	2,095
13	26	40°03'	67°37'	500	30	10A 4BE	1S 1LL 10	3B	62.0	62.4	35.03	1,200
14	27	39°45'	70°17'	510	70	1A			56.1	62.7	33.65	850
Totals				5,220	@355	23A 6BE 3YF 1BK	32LL 2SL 2S 10	44B 2M @75 P 8S 4H				

Abbreviations: Tuna - A = albacore, BE = big-eyed, BK = blackfin, YF = yellowfin.
Sharks - B = blues, H = hammerhead, M = mako, P = porbeagle, S = silky or sickle.
Misc. Fishes - LL = longnosed lancetfish, SL = shortnosed lancetfish, O = opah, S = swordfish.
@ - Approximate count. Sixty fish were taken on board and 102 tagged and released. The number lost alongside could not be counted exactly due to the intense activity of all hands, but it was conservatively estimated at 25 fish.

fall feeding ground. Adverse weather precluded operations on 2 days and also caused drastic curtailment of station 11, which was made 15 miles off the planned position on the 1,000-fathom curve. Fourteen long-line sets were successfully completed in 17 days at sea, a fortunate occurrence at that time of year (November). At least 3 strikes were obtained on trolled lures in the vicinity of stations 6, 9, and 13, respectively. All resulted in straightened hooks or parted gear.

DISCUSSION

While bluefin tuna were found along the 1,000-fathom curve for nearly 1,000 miles, from Norfolk Canyon (31°56' N., 74°18' W.) to the Eastern Channel (41°45' N., 65°25' W.), and



Fig. 4 - Hauling long-line gear on board R/V Crawford. The men at the rail tend the brake of the hauler and bring the branch lines through the roller removing baits and boating or tagging fish with the assistance of the men who haul and coil the float lines (right). The man at the hauler arranges the branch lines and hooks in the tub as the main line is coiled automatically, while his helper disconnects the lines, brings empty tubs, and removes the full ones.

northeastward at stations 11 and 12 (fig. 3), the outstanding result of the cruise was the discovery of the previously unknown and exceptionally dense concentration of this species indicated by the heavy catches at stations 1, 6, 13, and 14. The rate of 58 tuna per hundred hooks at station 6 is believed to be the highest ever experienced in exploratory long-line fishing in the northwestern Atlantic. Only 5 of the 320 baits set out at this station were recovered. The area of abundance extended at least 250 miles along the 1,000-fathom curve from the vicinity of Lydonia Canyon (40°02' N., 67°36' W.) to somewhere southwest of Hudson Canyon (39°16' N., 71°54' W.). The southwestern limit was poorly defined, as the next station in that direction was 180 miles away. The row of stations (3, 4, 5, and 8) further south yielded no bluefin, nor did station 7, inside of the 1,000-fathom curve. The northeastern limit of the thickly-popu-

lated area, as indicated by long-line catches, was fairly well established by the poor results at station 9, only 43 miles from Lydonia Canyon. The eastward extent of the species was not determined as some bluefin were taken at each of the 4 easternmost stations, 9-12. The duration of the concentration can only be estimated from the failure of the Delaware to catch bluefin in that general area in September and early October, and again in January and February.

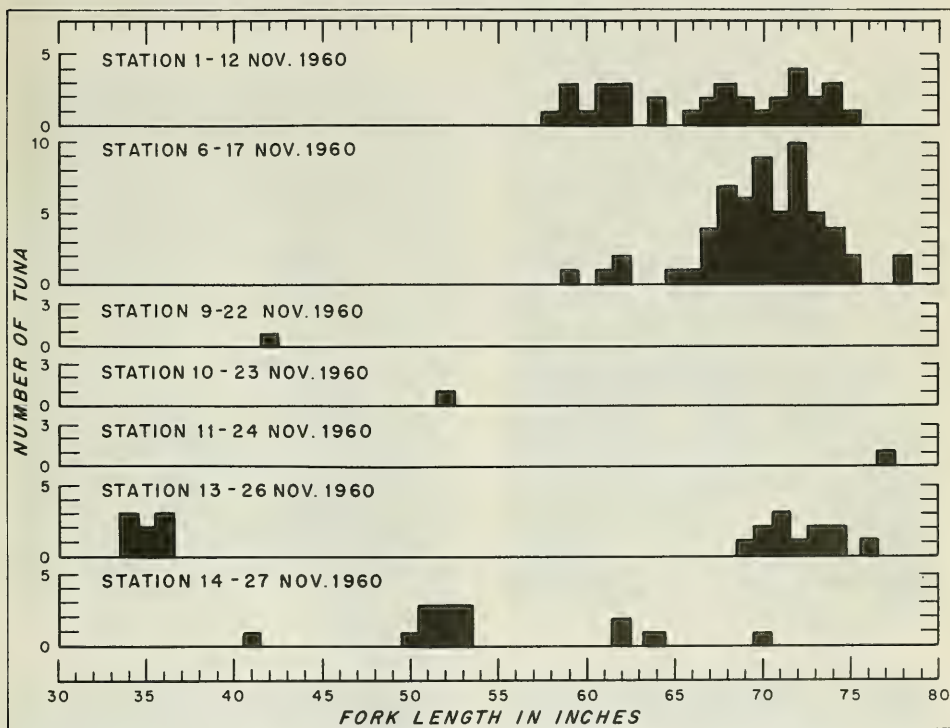


Fig. 5 - Length frequencies by 1-inch groups of bluefin tuna brought aboard R/V Crawford during cruise 56, by stations. Lengths were measured to the nearest inch with a tape laid along the body from tip of upper jaw to fork of tail.

Bluefin tuna were caught in waters whose average temperatures ranged from 49.1° to 63.9° F. at the surface and 45.5° to 63.4° F. at 180 feet. The average surface salinities varied from 32.90 to 35.30 parts per thousand. The larger catches, however, occurred in narrower temperature ranges of 56.1° to 62.3° F. at the surface and 60.6 to 63.2° F. at 180 feet, and in surface salinities of 33.65 to 35.30 parts per thousand. At two of the most successful stations, however, there were considerable differences between the temperatures observed at the opposite ends of the lines, and the bathythermograph slides also showed very complicated temperature structures. Furthermore, all 4 heavy catches were made at the entrances of canyons. It is possible that greater mixing of deep and surface waters occurs in those places, furnishing richer feeding grounds.

The dense schooling of this species may have been in preparation for migration to the offshore wintering grounds located during Delaware Cruise 59-1. The size composition of the bluefin tuna boated at the respective stations (fig. 5) suggests that the population was

changing. Those taken at stations 1 and 6 (12 and 17 November) were all over 57 inches long, but at stations 13 and 14 (November 26 and 27) in the same general area, many smaller ones were caught. A heavy concentration of this species was observed at about $38^{\circ}30'$ N. and $68^{\circ}30'$ W. in late May 1959 during Delaware cruise 59-6 (Anonymous 1959b). Fishing in the same area by the trawler Golden Eagle in early June produced no fish, but they were found closer inshore, near the area of the



Fig. 6 - Bringing a large bluefin tuna aboard R/V Crawford.



Fig. 8 - The author, chief scientist of R/V Crawford cruise 56, obtaining length-weight data for an albacore. Other albacore and small bluefin tuna from a catch made 80 miles south of Woods Hole are seen in the background.



Fig. 7 - Part of a catch of medium bluefin tuna from the concentration discovered by R/V Crawford along the 1,000 fathom-curve off southern New England.



Fig. 9 - An opah or moonfish, a little known oceanic species taken during cruise 56 of the R/V Crawford.

Crawford catches (J. L. Squire, Jr., personal communication). Many of the bluefin tuna caught on the Delaware were tagged and one was recaptured off Provincetown, Mass., in August 1959 (Mather 1960). Those observations suggest that the medium bluefin tuna tend to concentrate in waters, just north of the Gulf Stream in the spring preparatory to moving inshore to their summering grounds, and again along the 1,000-fathom curve in the fall preparatory to moving offshore to their wintering grounds. The trolling strikes and surface sightings indicate that those tuna sometimes feed on the surface along the 1,000-fathom curve during November as well as at the depth of the long-line hooks.

Albacore were extensively but much more thinly distributed (fig. 3), the catch rate never exceeding 2 fish per 100 hooks. They were found in waters whose mean temperatures varied from 56.1° to 66.0° F. at the surface but only from 60.6° to 64.6° F. at 180 feet, and where surface salinities averaged 33.65 to 35.28 parts per thousand. Big-eyed tuna were even less abundant, being found occasionally along the 1,000-fathom line in waters of about 60° F. Yellowfin and blackfin tuna were found only in the warm Gulf Stream water, and the failure to catch any istiophorid fish suggests strongly that they had also left the slope water, where they have been taken during the spring, summer, and early fall, due to its lower temperature. The catches of swordfish are of interest, in the absence of any quantity of data for November, as are the concentrations of porbeagle and blue sharks encountered, and the unusual number of lancetfish taken. Although sharks were numerous at some stations, only 2 of the tuna taken were mutilated, 1 at station 1 and the other at station 14.

LITERATURE CITED

- BULLIS, HARVEY R., Jr., and CAPTIVA, F. J.
1955. Preliminary Report on Exploratory Long-Line Fishing for Tuna in the Gulf of Mexico and the Caribbean Sea. Commercial Fisheries Review, vol. 17, no. 10 (October), pp. 1-20. (Also Separate No. 416.)
- _____, and MATHER, F. J., III.
1956. Tunas of the Genus Thunnus of the Northern Caribbean. American Museum Novitates, no. 1765, pp. 1-12.
- COMMERCIAL FISHERIES, U. S. BUREAU OF
1957a. Excellent Catch of Tuna Made South of Nantucket, M/V Delaware Cruise 57-3. Commercial Fisheries Review, vol. 19, no. 5 (May), pp. 28-29.
- 1957b. Experimental Long-Line Tuna Trip Successful, M/V Delaware Cruise 57-5. Commercial Fisheries Review, vol. 19, no. 8 (August), pp. 27-29.
- 1958a. Exploratory Tuna Fishing with Long-Lines in Western North Atlantic, M/V Delaware Cruise 57-8. Commercial Fisheries Review, vol. 20, no. 1 (January), pp. 38-39.
- 1958b. Tuna Fishing Explorations in Western North Atlantic Continued, M/V Delaware Cruise 58-2. Commercial Fisheries Review, vol. 20, no. 7 (July), pp. 35-36.
- 1958c. Tuna Fishing Explorations Continued in Western North Atlantic, M/V Delaware Cruises 58-3 and 58-4. Commercial Fisheries Review, vol. 20, no. 9 (September), pp. 47-48.
- 1959a. Commercial Stocks of Tuna Found in Western North Atlantic, M/V Delaware Cruise 59-1. Commercial Fisheries Review, vol. 21, no. 4 (April), pp. 46-47.
- 1959b. Good Catches of Tuna Taken on Edge of Gulf Stream South-by-East of Nantucket, M/V Delaware Cruise 59-6. Commercial Fisheries Review, vol. 21, no. 7 (July), pp. 40-41.
- 1960a. Tuna Distribution in South-Eastern Caribbean Sea and Occurrence of Royal-Red Shrimp off Trinidad Explored, M/V Oregon Cruise 66. Commercial Fisheries Review, vol. 22, no. 7 (July), pp. 30-31.
- 1960b. Area Between Georges Bank and Cape Hatteras Explored for Tuna Stocks, M/V Delaware Cruise 60-6. Commercial Fisheries Review, vol. 22, no. 7 (July), pp. 34-35.
- MATHER, FRANK J., III.
1960. Recaptures of Tuna, Marlin and Sailfish Tagged in the Western North Atlantic. Copeia, no. 2, pp. 149-151.
- MURRAY, J. J.
1952. Report on 1951 Exploratory Bluefin-Tuna Fishing in the Gulf of Maine. Commercial Fisheries Review, vol. 14, no. 3 (March), pp. 1-19. (Also Separate No. 309.)
1953. Gulf of Maine Bluefin Tuna Explorations - 1952. Commercial Fisheries Review, vol. 15, no. 7 (July), pp. 1-17. (Also Separate No. 353.)
1954. Gulf of Maine Bluefin Tuna Explorations - 1953. Commercial Fisheries Review, vol. 16, no. 7 (July), pp. 10-19. (Also Separate No. 374.)
- SQUIRE, JAMES L., Jr.
1959. New England Commercial Bluefin Tuna Purse Seining - 1958 Season. Commercial Fisheries Review, vol. 21, no. 2 (February), pp. 1-5. (Also Separate No. 538.)
- In press. Oceanic Tuna Distribution in the Northwest Atlantic. Fisheries Bulletin.
- WATHNE, FREDERICK.
1959. Summary Report of Exploratory Long-Line Fishing for Tuna in Gulf of Mexico and Caribbean Sea, 1954-1957. Commercial Fisheries Review, vol. 21, no. 4 (April), pp. 1-26. (Also Separate No. 545.)

Note: Acknowledgements: This cruise was made possible by grants number G-8339 and G-6172 from the National Science Foundation, by the Associates of the Woods Hole Oceanographic Institution who provided funds for fishing personnel, and by the loan of fishing equipment from the U. S. Bureau of Commercial Fisheries at Gloucester, Mass. Many of the officers and men of the Crawford worked during their off-watch periods to assist in handling the larger catches of fish; in addition, their fine handling of the vessel made it possible to fish successfully in weather which might otherwise have caused disaster. We are most grateful to all those persons and organizations who made the success of this cruise possible.

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THE COMPOSITION OF SHRIMP MEAL MADE FROM FRESH AND SPOILED SHRIMP HEADS^{1/}

By N. Alam Khandker*

ABSTRACT

To determine whether fresh as well as spoiled shrimp heads could be processed by a simple method to make meal was the purpose of this study. The differences in the chemical composition of several types of shrimp meals were observed. The protein content of shrimp meal is low compared to that of menhaden and other commercial fish meals. But even with a protein content of only 40 percent, shrimp meal may be of some commercial value as animal feed and its production might be profitable considering the low cost of processing.

INTRODUCTION

Shrimp heads are usually discarded at sea or in the freezing and canning plants in the process of deheading. In the plant the waste material creates a disposal problem. The head contains much of the viscera and offers a good prospect of turning it into meal for animal feed. At present some heads from canning plants are reduced to meal.

Shrimp heads are not always available in fresh condition, especially when the deheading is done on board the vessel. The effect of spoilage of the raw material on the chemical composition of the final product is not fully known, although it is a general belief that spoilage deteriorates the quality. Lassen et al. (1944) stated that the degree of freshness of the raw material is of primary importance in determining the quality of fish meal. On the contrary, Grau and Williams (1955) observed that growth of chickens was almost the same when they were fed with fish meals made from fresh as from spoiled mackerel.

The chemical composition of shrimp meal has been reported by several workers. The analysis by Daniel and McCollum (1931) showed 47.44 percent protein, whereas later analysis by Manning (1934) showed the much higher value of 54.51 percent. In the process of deheading by hand, the efficiency of the worker determines how much meat clings to the head. This difference may contribute considerably to the observed difference in protein content between shrimp meals.

The present work was done to determine whether fresh as well as spoiled shrimp heads could be processed by a simple method to make meal, and to observe the differences in the chemical composition of several types of shrimp meals in regard to protein, ether extracted fat, moisture, and ash.

MATERIALS AND METHODS

Two lots of shrimp heads were collected from a packing plant at Key West, Fla. The first lot was brought to the laboratory preserved in isopropyl alcohol. No preservative was used on the second lot, but it was kept in the shade at an air temperature of 75° to 80° F. A portion of the heads were taken for processing at 24, 48, and 72 hours from the time when the shrimp were taken out of the ice and deheaded at the packing plant.

To make meal from the shrimp heads, the heads were first dried in the sun. It usually took 24 hours of sunlight. The dried heads were then ground in a Waring blender.

It is believed that shrimp meal could be made on a commercial scale in an almost similar method as that used in the laboratory, thus minimizing the cost of production. The only

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^{1/}This paper is based on thesis work done at the University of Miami in partial fulfillment of Master of Science degree, and submitted in February 1960.

machinery required would be a simple grinder. If enough sunlight is not available, a simple hot-air drier could be used to dry the heads. Vincent (1950) calculated that with a simple type of drier and grinder, the total cost for producing one ton of shrimp meal would be \$17.60. This cost includes fuel, labor, electricity, bagging, and also incidental expenses. However, at present the cost of production would be higher than that quoted by Vincent.



Fig. 1 - Deheading of shrimp in a Key West shrimp packing plant.

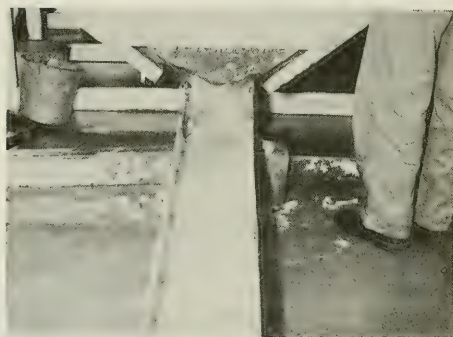


Fig. 2 - Shrimp heads moving through a chute at a South Atlantic shrimp packing plant.

The four samples of meals thus prepared were analyzed for crude protein, fat, moisture, and ash. Nitrogen was determined by Kjeldahl's method. Total quantity of protein ($N \times 6.25$) was calculated from this. In shrimp meal a part of the total nitrogen is contributed by chitin, a N-acetylated glucosamine polysaccharide. Since the proteinaceous fraction of nitrogen apart from that contributed by chitin is the standard for evaluating the meal, the crude protein was estimated by deducting the value of protein contributed by chitin from the total protein content. The determination of protein from chitin was made according to the method devised by Brown (1959) using the factor 6.25.

RESULTS

Table 1 shows the analysis of the different samples of shrimp meals. The percentage of protein was lowered by about 10 percent during the first 24 hours of spoilage. During spoilage enzymatic and bacterial actions break down protein to amino acids and subsequently to ammonia and other volatile substances which are lost.

The meals made from spoiled shrimp heads showed relatively lower protein content than that of the meal made from fresh heads. So, in terms of quantity of protein, the quality was deteriorated. Meals made from spoiled heads had some offensive odor, and that increased with the increase in days of spoilage.

Table 1 - Analysis of Shrimp Meal Made from Fresh and Spoiled Heads						
Samples of Meal from	Total Protein	Protein from Chitin	Crude Protein	Ether Extract	Moisture	Ash
Fresh heads	47.95	3.60	44.35	4.28	4.75	20.90
Spoiled heads:						
24 hours ¹	42.68	3.45	39.23	3.39	7.75	20.61
48 hours ¹	42.51	3.00	39.51	3.43	6.75	21.72
72 hours ¹	41.49	3.30	38.19	4.25	7.04	23.10

¹ Indicates the lapse of time between when the shrimp were taken from the ice and deheaded at the packing plant.

Note: The difference between total composition shown and 100 percent is undetermined.

CONCLUSION

The protein content of shrimp meal is low compared to that of menhaden and other commercial fish meals, which is generally 55 to 65 percent. However, with an average protein content of even 40 percent, meal made from fresh as well as spoiled shrimp heads may be of some commercial value as animal feed, and its production might be profitable considering the low cost of processing.

LITERATURE CITED

- BANGHAM, J. L.
1950. Utilizing Waste Fish Resulting from the Shrimping Industry. Fish Meal & Oil Industry, Dec.
- BROWN, RUSSEL L.
1959. Protein Analysis of Shrimp Waste Meal. Commercial Fisheries Review, vol. 21, no. 2a (February Supplement).
- BUTLER, C.
1949. Fish Reduction Processes. U. S. Fish and Wildlife Service Fishery Leaflet 126.
- DANIEL, E., PETERSON, and McCOLLUM, E. V.
1931. Studies on the Nutritive Value of Fish Meals. U. S. Fish and Wildlife Service Invest. Rept. No. 2.
- GRAU, C. R., and WILLIAMS, M. A.
1955. Fish Meal as Amino Acid Sources in Chick Rations. Poultry Science, vol. 34.
- LASSEN, S.; BACON, K.; and DUNN, K. J.
1944. The Relationship of Nutritive Value of Condensed Fish Solubles to Quality of Raw Materials. Poultry Science, vol. 28.
- MANNING, J. R.
1934. Value of Shrimp Meal. U. S. Bureau of Fisheries Memo S-328.
- SPARRE, T.
1953. Small Scale Manufacture of Fish Meal. FAO Fisheries Bulletin, vol. 6, no. 1-2.
- U. S. FISH AND WILDLIFE SERVICE.
1951. Suggested Code for Fish Meal, Tech. Note No. 12. Commercial Fisheries Review, vol. 13, no. 11a (November Supplement). (Also see Sep. No. 299.)
- VILBRANT, F. C.
1930. Utilization of Shrimp Waste. Rept. U. S. Comm. of Fish, for 1930.
- VINCENT, DANIEL B.
1950. Potentialities for Increased Utilization of Scrap Fish and Fish Waste in the Gulf and Caribbean Area. Proc. Gulf and Caribbean Fish. Inst., Third Ann. Session.



DEVELOPMENT OF HERRING CURING

The preparation of brine-cured herring has been an important industry since the early Middle Ages. The first authentic writings dealing with the curing of herring date from the Twelfth Century. Cured herring was one of the principal articles traded on the continent of Europe by England. The herring fisheries were the cause of several wars in the Baltic between some of the Hanseatic cities and various Baltic states claiming grounds fished by the Hanseatic towns. The wars between England and Holland are held to have been caused in general by their rivalry in trade and in the acquisition of colonial possessions, but the immediate cause was a struggle for control of the herring fishery on the East Anglian coast.

The method of herring curing is considered to have been crude until the time of William Beuckels, a fish merchant of Biervliet, in Flanders, who during the Fourteenth Century, greatly improved the methods in use. This new development laid the foundation for the great wealth acquired later by the Netherlands from the fish-curing business. Beuckels died in 1397, and his work was later considered to be so valuable that a monument to his memory was erected in his native village by Charles V.

The first mention we have of pickled herring in America is by Josselyn, in the Seventeenth Century, who in his Chronological Observations of America states: "We used to qualify a pickled herring by boiling of him in milk." It is believed, however, that the pickling of herring was carried on by the earliest settlers of America and possibly by the fishermen who came to these shores from Europe even before the first settlements were made, since herring were readily caught in shore waters and since herring curing was even then the most important fishery industry in Europe.

--Curing of Fishery Products,
Research Report 18



TRENDS AND DEVELOPMENTS

Alaska Fishery Exploration and Gear Research

EXPLORATORY FISHING FOR BOTTOM FISH IN GULF OF ALASKA:

M/V "Tordenskjold" Cruise 2: Exploratory fishing to determine the availability and distribution of the various bottom species from close inshore to 250 fathoms in the Gulf of Alaska between Capes Spencer and St. Elias, was conducted by the U. S. Bureau of Commercial Fisheries from June 2 to September 6, 1961. This work was followed by a short comparison survey in the latitude of Nuka Bay to Portlock Bank until September 15, 1961. The M/V *Tordenskjold*, a Seattle commercial schooner-type trawler, was chartered for the project. The gear used was a commercial-size otter trawl net spread by galvanized steel doors of special design but readily available commercially in Seattle.



M/V *Tordenskjold*, the chartered schooner-type trawler.

Objectives of the cruise were multiple. The primary purpose was to obtain general information of latent bottom fish populations,

a vital prelude to systematic exploration and ultimate commercial utilization. Secondary purposes accomplished included tagging of king crab and other species; collection of specimens and scientific data on sizes, ages, and sex ratios of commercially valuable species; and recording of oceanographic and meteorological conditions.

The method was to follow a grid pattern of 261 one-hour trawl stations drawn on U. S. Coast & Geodetic Survey Chart #8002, fishing, wire dragging or sounding alone, whichever seemed best. These stations were 6 miles of latitude apart and 8 miles of longitude. Edges at 140 and 250 fathoms were also tested.

A total of 261 stations were established in the area, of which 200 were found feasible to attempt fishing. The most productive grounds for fish and shellfish appeared to be shoreward from about 70 fathoms, with exceptions of certain deeper tows in submarine canyons and on deeper edges beyond 100 fathoms. Large mid-depth areas were found almost completely unproductive of commercial species.

Note: See Commercial Fisheries Review, Dec. 1961 p. 42.



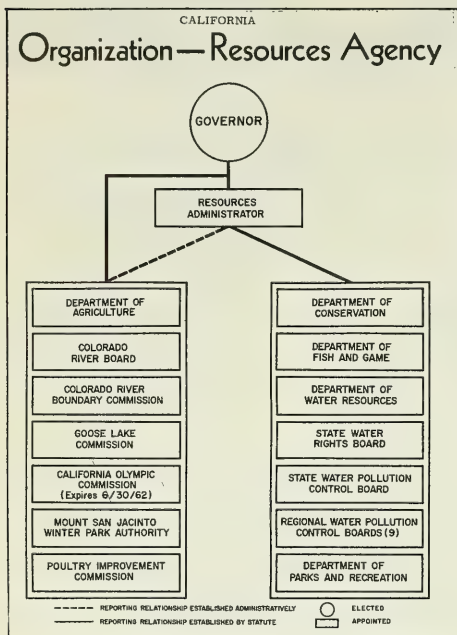
California

FISHERIES INCLUDED IN NEW NATURAL RESOURCES AGENCY:

As of October 1, 1961, the California Department of Fish and Game became one of several new state agencies, whose administrators are responsible to the Governor of California for the policy-making and program evaluation activities of most state departments, boards, and commissions. The administrators were appointed by the Governor.

Fish and Game is now a part of the Resources Agency.

Part of the reorganization came about as a result of legislative action requested by the Governor. The rest is a result of temporary administrative action on the part of the Governor.



In submitting the new combined agencies plan the Governor said that State government has grown too unwieldy with too many department heads answering directly to the Governor.

The Governor says the new setup will permit much better coordination among and within the agencies and give him a more workable organization in that lines of communication will be more direct within the agencies and between the agencies and his office. He believes also that the top level authority of the agency administrators--just under the Governor's level--will afford better long-range planning and program evaluation.

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SHRIMP AND CRAB STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 61S7: Exploring for concentrations of pink shrimp and dungeness crabs was the objective of the California Department of Fish and Game research vessel N. B. Scofield from September 28 to November 9, 1961. The area covered was the coastal waters off northern and central California from Fort Bragg to San Francisco.

SHRIMP: The shrimp phase of the trip was: (a) to explore for concentrations of pink shrimp, *Pandalus jordani*; (b) to determine size, sex, and weight of shrimp from different areas; (c) to make bathythermograph casts to obtain bottom temperatures in shrimp fishing areas.

A total of 66 tows was made with a 20 x 6 ft. beam trawl having a cotton net of 1¼-inch mesh--32 of the 66 tows were in Area B-1 from Big Flat to Westport and 34 in Area B-2 from Ft. Ross to Bodega Head.

The best shrimp catches in Area B-1 were made off Usal in 75 to 80 fathoms and off Westport in 70 to 73 fathoms. One tow off Usal produced 1,800 pounds of shrimp per hour and another 900 pounds per hour. The area of concentration, which measured approximately 1½ x 4 miles, was considerably reduced compared with the concentration area a year ago. At that time, the school measured approximately 3 x 15 miles and catches at the rate of 2,000 pounds per hour were quite common. Another small area of shrimp concentrations was discovered off Westport where one tow produced 450 pounds per hour. It measured approximately 2 x 3 miles and tows within the perimeter ranged from 100 to 450 pounds per hour. No shrimp concentration could be found off Big Flat where six tows were made in 50 to 80 fathoms.

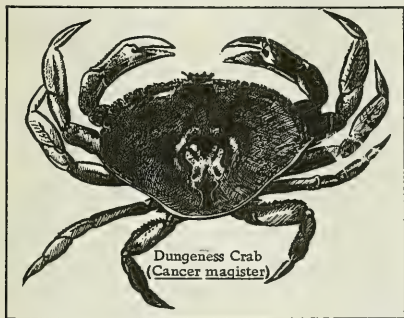
Area B-2 operations revealed a shrimp school of minor concentration off Ft. Ross and the Russian River in 54 to 64 fathoms of water. It was approximately 3 miles wide by 7 miles long. Most of the tows within the perimeter produced catches of 100 to 200 pounds per hour; one tow produced 390 pounds per hour.

Samples of shrimp were obtained in both areas (B-1 and B-2) and in 56 of the 66 tows made. Fifty shrimp from each tow were

sexed, measured, and weighed at sea. The counts typically ranged from 70 to 100 per pound (heads on) in both areas. Many of the female shrimp contained head roe and a few were carrying eggs.

Sixty-four bathythermograph casts were made. Bottom temperatures were obtained in all areas where shrimp were found. These temperatures will be determined from the slides at a later date. Surface temperatures ranged from a high of 58.5° F. off Bodega Head on October 1 to a low of 50.4° F. off Uval on October 10.

CRAB: The crab phase of the trip was: (a) to random-sample the preseason population of market or dungeness crabs (*Cancer magister*); (b) to determine size, sex ratios, and conditions of crabs from different areas.



Dungeness Crab
(*Cancer magister*)

Sampling stations were selected randomly from the crab area between Point Montara and the Russian River. Fifty-five 40-inch commercial-type crab traps, without escape ports, were fished 6 to 40 fathoms. A string of five traps was baited with rockfish carcasses and squid and allowed to fish overnight at each station; however, several strings were not pulled for 43 to 96 hours because of bad weather.

In all, 4,316 crabs were taken in the traps; 1,595 legal males, 2,566 sublegal males, and 155 females. Twenty-five of the females were carrying eggs. The average legal catch per trap was 3.2 crabs which is very poor compared with previous years. The sublegal males averaged 5.1 per trap which was much higher than last year's catch.

The best catches were in the vicinity of the San Francisco Lightship northwest

toward Point Reyes and south to Pt. Montara in 10 to 25 fathoms.

The preseason catch of legals this year was down 44 percent from last year, indicating a poor season is in store for San Francisco crab fishermen. The decrease in abundance of legal crabs is believed to be due to unfavorable environmental conditions which reduced the strength of the incoming year-classes. This is borne out by the fact that the preseason sublegal catch was low in both 1959 and 1960.

Note: See Commercial Fisheries Review, Dec. 1961 p. 24.

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 61N17a & b-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (Nov. 7-10, 20-22, 1961) in the Carquinez Strait area to capture marked salmon fingerlings on their seaward migration. A nylon midwater trawl with 25-foot square opening was used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3 p.m. and each tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. A flow meter was used to measure the amount of water strained by the net on each tow.

A total of 78 tows was completed in the Strait during this cruise yielding a catch of 158 king salmon (*Oncorhynchus tshawytscha*) fingerlings, and 2 king salmon adults, none of which was marked. One marked adult steelhead (*Salmo gairdneri*) was also captured.

Other species appearing in the catch, listed in order of abundance were: northern anchovy (*Engraulis mordax*)--6,950; American shad (*Alosa sapidissima*)--4,701; striped bass (*Roccus saxatilis*)--1,527; topsmelt (*Atherinops affinis*)--125; Pacific herring (*Clupea pallasii*)--75; starry flounder (*Platichthys stellatus*)--5; jack smelt (*Atherinops californiensis*)--1; tom cod (*Microgadus proximus*)--1; northern midshipman (*Porichthys notatus*)--1; three-spined stickleback (*Gasterosteus aculeatus*)--1; and threadfin shad (*Dorosoma petenense*)--1 fish. The

recovery of the threadfin shad marks the first observation of this species in delta waters.

Note: See Commercial Fisheries Review, Jan. 1962 p. 14.

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M/V "N. B. SCOFIELD"
STUDIES RADIOACTIVITY
OFF SAN CLEMENTE ISLAND:

Cruise 61S6: To collect a variety of biological and water samples which might be expected to accumulate radioactive particles resulting from a U. S. Navy experiment using radio-isotopes as a tracer in underwater explosions and to observe the effects on marine life of a 5-ton high explosive charge were the objectives of the cruise September 18-20, 1961. The area covered was in the vicinity of Wilson Cove on northeast side of San Clemente Island.

On September 19 at approximately 3:25 p.m., eleventh in a series of high-explosive charges was detonated by the U. S. Navy. Facts concerning the charge are: (a) size and form--10,000 pounds of HBX-1 precast in a spherical shape about 5½ feet in diameter with a booster charge of 125 lbs. of TNT; (b) depth of charge--16 feet; (c) distance from shore--2,400 feet; (d) depth of water--300 feet; (e) location of charge--lat. 32°57'21" N., long. 118°30'20" W.; (f) radioactive tracer--approximately 600 grams of insoluble particulate Lutetium Oxide containing about 16 grams (500-800 curies) of radioactive Lutetium-177 Oxide (half-life 6-8 days) was placed inside the charge; (g) a single recording barge, and six small boats carrying instruments were located at points about 1,200 feet from the shot point.

On the morning of September 19 the N. B. Scofield placed anchored set lines and lobster traps at two locations on a line between the shot point and Wilson Cove.

After the detonation, the vessel proceeded into the explosion area and a skiff was put over the side to allow greater freedom in picking up samples.

The Navy marked the explosion area with green dye (fluorescein) and two parachute buoys. One buoy had a 50-foot line, and the other a 20-foot line. Both were marked with flashing lights and served to indicate the general drift of the water mass.

The fish kill included approximately 25 rockfish (*Sebastes* sp.) and 2,000 jack mackerel (*Trachurus symmetricus*).

At 1700 a drift set-line was placed about 200 feet north of the edge of the green dye marker.

The vessel then picked up samples of dead fish, occupied a night-light station, made several plankton tows and water sample collections.

The set lines and traps were picked up during the morning of September 20. A plankton tow was conducted about 5 miles NNE. of the northern tip of San Clemente Island in the area where the last traces of green dye were perceived and where the water mass appeared thoroughly mixed with open-sea water.

The vessel returned to Los Angeles Harbor.

* * * * *

PELAGIC FISH POPULATION
SURVEY CONTINUED:

M/V "Alaska" Cruise 61A7-Pelagic Fish: The coastal waters from Santa Rosalia Bay, Baja California to San Diego, Calif., were studied October 2-20, 1961, by the California Department of Fish and Game research vessel *Alaska* (1) to survey the sardine population to determine the amount of recruitment from the 1961 spawning and to measure the population density of older fish; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies.



M/V *Alaska* Cruise 61A7-Pelagic Fish.

A total of 79 night light stations were occupied. Sardines were taken at 5, anchovies at 9, Pacific mackerel at 6, and jack mackerel at 4.

The vessel traveled 469 miles between light stations during which 36 anchovy schools and 16 unidentified schools were observed. An extensive school group of large Pacific mackerel was sighted during daylight hours off Cape Colnett.

Sardines of the 1961 year-class were taken at two stations. These young fish were taken from schools comprised of over 98 percent anchovies. In addition, one sample comprised of fish of the year mixed with adult sardines was taken. Adult sardines were taken at two additional stations.

Many schools of anchovies were attracted to the light; however, no sets were attempted when only small "pinhead" size anchovies were present. Large anchovies (110-135 mm.) were distributed more offshore than the smaller ones. Stations located 6 to 15 miles offshore in warmer and clearer water produced the larger fish.

This cruise completes the 1961 young fish survey in Baja California. This and cruises 61A5 and 61A6, show results similar to the 1960 surveys in the same area: sardines were scarce and anchovies were abundant. As in 1960, the incoming year class appears to be of subnormal strength. Anchovies are again abundant, especially in central Baja California.

One set was made with a deep-sea free-floating fish trap on loan from Scripps Institution of Oceanography. The set, made in 850 fathoms, caught two deep-water crabs (*Paralomis* sp.). Recovery of the trap at night was difficult because, at close range, radar echoes from waves obscure the echo from the trap reflector. This problem can be alleviated in the future by scheduling the return of the traps to the surface during daylight hours when visual means can be used to supplement radar.

Sea surface temperatures ranged from 58.9° F. near Point Santo Tomas to 70.2° F. at Santa Rosalia Bay. Fair weather prevailed during the entire cruise.

M/V "Alaska" Cruise 61A8-Pelagic Fish:
A survey was made of the coastal waters from Los Coronados Islands to Point Conception, including the Channel Islands by the California Department of Fish and Game research vessel Alaska during October 30-November 17, 1961. The purpose of the trip was: (1) to determine the amount of recruitment from this year's sardine spawning and to measure the population density of older fish; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies; (3) to make incidental collections of other species.

A total of 108 light stations were occupied. Sardines were collected at three stations, northern anchovies at 13, Pacific mackerel at 10, and jack mackerel at 8. Squid were seen or sampled at 32 stations.

In the course of 510 miles of nighttime scouting, 159 schools were sighted. These included 67 anchovy, 67 mackerel, and 25 unknown schools. No schools were identified as sardines.

Adult sardines caught off Gaviota and fish of the year caught in Los Angeles Harbor were mixed with large numbers of anchovies. Only the adult sardines taken near Santa Catalina Island were from an unmixed school.

The southern California survey in 1961 showed the lowest density of sardines since 1957. The sardine density was about one-half of that found during the 1960 survey and about one-sixth of that found in 1959. The lack of sardines in southern California this year is consistent with the very poor commercial season to date.

Sea surface temperatures ranged from 56.3° F. at Carrington Point, Santa Rosa Island and San Mateo Point, to 62.2° F. off the west end of Catalina Island.

Note: See Commercial Fisheries Review, December 1961 p. 25, November 1961 p. 15.



Cans--Shipments for Fishery Products, January-October 1961

Total shipments of metal cans during January-October 1961 amounted to 108,437

short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 107,853 tons in the same period of 1960. Canning of fishery products in January-October 1961 was confined largely to tuna,



jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries Investigations

TUNA STUDIES IN SOUTH PACIFIC BY M/V "CHARLES H. GILBERT":

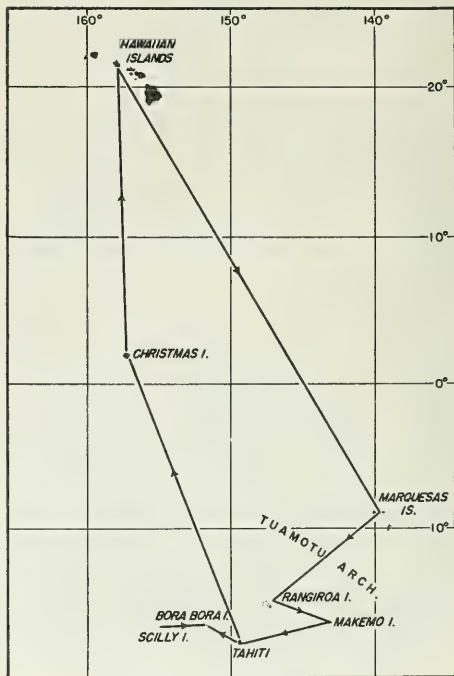
Cruise 54 (September 29-December 4, 1961): Two months of tuna studies in the Marquesas, Tuamotu, Society, and Line Islands were completed when the U. S. Bureau of Commercial Fisheries research vessel *Charles H. Gilbert* returned to its base at Kewalo Basin, Honolulu, on December 4, 1961. The expedition successfully carried out its principal missions of collecting tuna blood samples and observing the behavior of skipjack tuna in the various island areas.

Blood specimens from 760 skipjack and a smaller number of yellowfin tuna were collected. Analysis for blood types is expected to provide information with which to check and refine the biologists' theories about the relationships of the skipjack populations of the various South Pacific island groups to one another and to the skipjack (aku) of Hawaiian waters. During the cruise, observations of the ocean's temperature and salinity were combined with blood collection work with the idea that some environmental factors might appear related to the population differences shown by blood analysis.

High-speed movie cameras were used in the underwater observation chambers of the *Charles H. Gilbert* to film the extremely rapid movements of feeding skipjack (*Katsuwonus pelamis*). The details of fin and

mouth movements revealed by these films may give clues to an understanding of the variable and unpredictable response of tuna to bait and fishing lures, a practical problem for commercial fishermen. Material was also gathered for a comparison of the rate at which tuna schools take the hooks and the amount of food in the stomachs of the fish. Four skipjack and 1 yellowfin (*Neothunnus macropterus*) schools were observed from the bow chamber. Owing to a shortage of bait, no skipjack were caught by pole-and-line for stomach analyses from these 4 schools. Biologists feel that it would be premature to draw any conclusions from their first experiment with plastic skipjack "decoys" towed in the vicinity of skipjack schools, but it was their impression that the skipjack showed a curious interest in the artificial tuna and were not repelled by them.

The availability of the Marquesan sardine used as tuna bait was moderately good in



M/V *Charles H. Gilbert* Cruise 54.

certain areas of the Marquesas, but the schools of sardine were smaller than those found on earlier cruises. Skipjack were moderately abundant in all of the areas visited. However, with the exception of a few schools of 28-30 pound fish encountered in the Marquesas, the schools were composed of medium and small skipjack.

In the Marquesas Islands, attempts were made on 5 different schools to obtain synchronous records of skipjack behavior, stomach contents, and catch rates throughout a fishing period. Three of the schools remained at the boat long enough to obtain the desired data. During one of the 3 sequences not only skipjack but also yellowfin and dolphin (*Coryphaena hippurus*) were observed and caught. Digestive tracts of 203 skipjack, 15 yellowfin, and 4 dolphin were preserved.

The expedition accomplished a number of interesting secondary missions, including transportation of 2,000 live pearl oysters from Seilly Island (Fenua Ura) to Bora Bora at the request of French authorities, collection of reef-fishes from over 20 localities, and collection of blood serum from Marquesan fresh-water eels. In cooperation with the Division of Fish and Game of the State of Hawaii, about 7,000 live groupers and snappers, valuable food fish of types lacking in Hawaiian waters, were brought from Moorea in the live-wells of the Charles H. Gilbert and released around Oahu.

MONOFILAMENT GILL NETS TESTED IN HAWAIIAN SKIPJACK FISHERY:

Trials of monofilament gill nets in the Hawaiian skipjack tuna fishery were carried out from July 23, 1961 to September 29, 1961. These nets were successful in catching skipjack but have not yet been fished in such a manner as to demonstrate their commercial feasibility.

This study, a cooperative effort of the Hawaii Division of Fish and Game and the U. S. Bureau of Commercial Fisheries Biological Laboratory in Hawaii, was undertaken to develop a means of increasing the skipjack catch. The Hawaiian pole-and-line skipjack fishery is presently a declining industry, as a result of a static level of fishing efficiency and increasing operational costs.

Monofilament nets fulfilled the basic requirement of being usable by the existing fleet and were, in addition, noted for a high fishing efficiency and modest cost. Although several modifications of the gear were used, the basic shackle was 100 fathoms in length and 10 fathoms in depth. Nets were of two mesh sizes; a $5\frac{1}{2}$ -inch mesh (stretched measure) net for the smaller skipjack ranging from 4 to about 10 pounds and a $7\frac{3}{4}$ -inch mesh net for skipjack of about 18 pounds. A skipjack sampan, the Broadbill, was chartered for the trials.

The two months of field work were concentrated on developing a daylight fishery, and in this respect the method developed has not been tried in other fisheries. The method was to locate a skipjack school by the usual pole-and-line method of finding "working" bird flocks, to chum the fish school to the stern of the boat, set a single shackle of net from a wooden bin while the boat moved ahead at chumming speed, carry out pole-and-line fishing, and haul in the net with a powerblock. The use of live-bait was to create a feeding frenzy, since skipjack are able to see monofilament nets in the clear waters surrounding the Hawaiian Islands.

Field work was suspended when the small catches by the commercial boats indicated an earlier than usual end of the skipjack season. While the results were inconclusive, they were moderately encouraging. The highest catch from a single set of the monofilament gill net was 122 skipjack. The catches from 32 sets were not large enough to make it appear likely that the gill net will supplant the present pole-and-line method. It appears likely, however, that a combination of the two methods can be used effectively to increase the catch from each school fished. Additional trials are planned during the 1962 skipjack season.

Note: See Commercial Fisheries Review, Oct. 1961 p. 11.



Federal Aid for Sport Fish and Wildlife Restoration

INTERIOR APPORTIONS MORE FUNDS TO STATES:

Distribution of an additional \$6,950,000 to States for restoration of fish and wildlife projects for the year ending June 30, 1962,

was announced on November 30, 1961, by Secretary of the Interior Stewart L. Udall. This brings to \$19,800,000 the total to be apportioned, since \$12,850,000 was allotted on a preliminary basis last July 1 for State fish and wildlife projects.

Of the \$19,800,000, a total of \$14,000,000 is for State and territorial areas for restoration of wildlife and \$5,800,000 for restoration of fish.

The fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment.

Federal Aid money is matched by the States on the basis of not to exceed 75 percent Federal to 25 percent state funds.

Federal Aid to Fish and Wildlife Restoration programs are administered by the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service.

Note: See Commercial Fisheries Review, August 1961 p. 24.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.6 million pounds of fresh and frozen fishery products were purchased in September 1961 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in August 1961 by 20.6 percent and 5.9 percent under the amount purchased in September 1960. The value of the purchases in September 1961 was lower by 12.1 percent as compared with the previous month, but 2.5 percent greater than in the same month of 1960. Higher prices accounted for the greater value for September 1961.

During the first 9 months of 1961 purchases totaled 16.6 million pounds (valued at \$8.4 million)--a drop of 6.4 percent in quantity and 9.1 percent in value as compared with the same period in 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, September 1961 with Comparisons

QUANTITY				VALUE			
Sept.	Jan.	Sept.	Sept.	Sept.	Jan.	Sept.	Sept.
1961	1960	1961	1960	1961	1960	1961	1960
(1,000 Lbs.)				(\$1,000)			
1,586	1,686	16,587	17,722	951	928	8,355	9,188

Prices paid for fresh and frozen fishery products by the Department of Defense in September 1961 averaged 60 cents a pound, 5.8 cents more than the 54.2 cents paid in August 1961 and 5 cents more than the 55 cents paid during September 1960.

Canned Fishery Products: Canned salmon was the principal canned fishery product purchased for the use of the Armed Forces dur-

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, September 1961 with Comparisons

Product	QUANTITY				VALUE			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1961	1960	1961	1960	1961	1960	1961	1960
	(1,000 Lbs.)				(\$1,000)			
Tuna	-	116	4,393	2,370	-	51	1,940	1,044
Salmon	1,401	2,304	1,403	2,308	891	1,565	893	1,568
Sardine	6	-	121	99	2	-	57	41

ing September 1961. In the first 9 months of 1961, purchases of the three canned fishery products were up 23.9 percent in quantity, and 8.9 percent in value.

* * * * *

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.6 million pounds of fresh and frozen fishery products were purchased in October 1961 by the Military Subsistence Supply Agency. This was substantially greater than the quantity purchased in September 1961 by 65.8 percent and was 48.9 percent above the amount purchased in October 1960. The value of the purchases in October 1961 was up by 80.5 percent as compared with the previous month and 86.4 percent more than in the same month of 1960. The greater increase in value was because of higher prices in 1961.

During the first 10 months of 1961 purchases totaled 19.2 million pounds (valued at \$10.1 million)--a drop of only 1.4 percent in quantity and 0.4 percent in value as compared with the same period in 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, October 1961 with Comparisons

QUANTITY					VALUE				
Oct.		Jan.-Oct.			Oct.		Jan.-Oct.		
1961	1960	1961	1961	1960	1961	1960	1961	1961	1960
..... (1,000 Lbs.) .....					..... (\$1,000)				
2,629	1,766	19,216	19,488		1,717	921	10,072	10,109	

Prices paid for fresh and frozen fishery products by the Department of Defense in October 1961 averaged 65.3 cents a pound, 5.3 cents more than the 60 cents paid in September 1961 and 13.1 cents more than the 52.2 cents paid during October 1960. The higher average price for purchases in 1961 was because of generally higher prices for all types of fresh and frozen fishery products and probably an increase in the purchase of higher-priced products.

Canned Fishery Products: Canned tuna was the principal canned fishery product purchased for the use of the Armed Forces during October 1961. In the first 10 months

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, October 1961 with Comparisons

Product	QUANTITY					VALUE				
	Oct.		Jan.-Oct.			Oct.		Jan.-Oct.		
	1961	1960	1961	1961	1960	1961	1960	1961	1961	1960
..... (1,000 Lbs.) .....					..... (\$1,000)					
Tuna	2,217		771	6,610	3,141	1,114	2,349	3,054	1,393	
Salmon	-		1,285	1,403	3,593	-	868	893	2,436	
Sardine	4		25	125	124	2	10	59	51	

of 1961, purchases of the three canned fishery products were up 18.9 percent in quantity and 3.2 percent in value. In 1961 considerably more tuna and substantially less salmon was purchased than in 1960, which accounts for the smaller increase in value.

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DEPARTMENT OF DEFENSE PURCHASES, JANUARY-NOVEMBER 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.4 million pounds of fresh and frozen fishery products were purchased in November 1961 by the Military Subsistence Supply Agency. This was less than the quantity purchased in October 1961 by 10.3 percent, but was 36.9 percent above the amount purchased in the same month of 1960. The value of the purchases in November 1961 was down 24.9 percent as compared with the previous month, but 43.5 percent more than in the same month of 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, November 1961 with Comparisons

QUANTITY					VALUE				
Nov.		Jan.-Nov.			Nov.		Jan.-Nov.		
1961	1960	1961	1961	1960	1961	1960	1961	1961	1960
..... (1,000 Lbs.) .....					..... (\$1,000)				
2,358	1,723	21,574	21,211		1,289	898	11,361	11,007	

During the first 11 months of 1961 purchases totaled 21.6 million pounds (valued at \$11.4 million)--up 1.7 percent in quantity and 3.2 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in November 1961 averaged 54.7 cents a pound, about 2.6 cents more than the 52.1 cents paid in November 1960 and 10.6 cents more than the 65.3 cents paid the previous month. This means that more of the higher-priced fishery products were bought in October than in November 1961.

Canned Fishery Products: Canned tuna was the principal canned fishery product purchased for the use of the Armed Forces

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, November 1961 with Comparisons

Product	QUANTITY					VALUE				
	Nov.		Jan.-Nov.			Nov.		Jan.-Nov.		
	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) .....					..... (\$1,000)					
Tuna	48	422	6,658	3,563		26	196	3,080	1,589	
Salmon	-	-	1,403	3,593		-	-	893	2,436	
Sardine	6	2	131	126		4	1	63	52	

during November 1961. In the first 11 months of 1961, purchases of canned fishery products were up 12.5 percent in quantity, but down 1.0 percent in value. The value was down because considerably more tuna and substantially less salmon was bought in 1961.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

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MILITARY SUBSISTENCE SUPPLY AGENCY NAME CHANGED:

The Military Subsistence Supply Agency, effective January 1, 1962, changed its name to Defense Supply Agency. Also the field offices were redesignated Defense Subsistence Supply Centers. The change in the

titles of the Military Subsistence Supply Agency Offices does not affect the mission or responsibilities of those offices.

Note: See Commercial Fisheries Review, Oct. 1959 p. 26.



Fisheries Loan Fund

LOANS APPROVED, NOVEMBER 1-DECEMBER 31, 1961:

From the beginning of the program in December 1956 through December 31, 1961, a total of 1,066 applications for loans amounting to \$30,843,057 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 560 (\$13,705,439) were approved, 363 (\$9,580,710) were declined or found ineligible, 104 (\$5,466,077) were withdrawn by applicants before being processed, and 39 (\$542,037) were pending as of the end of 1961. Of the applications approved, 222 (\$1,548,794) were approved for amounts less than applied for.

The following loans were approved from November 1, 1961, through December 31, 1961:

New England Area: Harold D. Abbott, East Boothbay, Maine, \$1,700; Gaetano S., Inc., Boston Mass., \$10,000; and Little Chuck Corp., Boston, Mass., \$7,400.

South Atlantic and Gulf Area: Tiliakos Bros., Fernandina Beach, Fla., \$16,500; Harold L. Von Harten, Key West, Fla., \$4,255; James L. Simpson, St. Mary's Ga., \$18,000; John Zar, Jr., Lafitte, La., \$14,000; and O. W. Franks, Morgan City, La., \$11,500.

California Area: Jim A. Trammell, Costa Mesa, \$5,970; Bruce L. Thompson, Crescent City, \$4,200; David H. Krueger, Eureka, \$8,300; William Hansen, Morro Bay, \$2,180; Edmund Gann, et al, San Diego, \$128,700; Frank A. Maniscalco, San Francisco, \$5,000; and Neal O. Busch, Sebastopol, \$10,000.

Hawaii Area: Maui Fisheries & Marine Products, Ltd., Kahului, Maui, \$73,292; Sea Queen Fishing Co., Honolulu, \$20,330.

Pacific Northwest: Adolph J. Sund, Ilwaco, Wash., \$8,750; Raymond Hall, Newport, Oreg., \$40,000; Wesley H. Christensen, Port Angeles, Wash., \$8,900; Dwane E. Clark, Port

Angeles, Wash., \$11,000; and George A. Strand, Stanwood, Wash., \$16,528.

Alaska: Douglas Freed, Elfin Cove, \$4,600, and Andrew J. Barlow, Sr., Wrangell, \$5,600.



Fish Flour

INTERIOR DEPARTMENT AIDS IN INTERNATIONAL PROTEIN-DEFICIENCY STUDY:

Participation in a long-range international program to determine the effectiveness of fish flour as an additive in protein-deficient diets by the U. S. Department of the Interior was announced on December 19, 1961.

The program, sponsored by the Food and Agriculture Organization of the United Nations, is an outgrowth of the FAO International Conference on Fish in Nutrition held in Washington, D. C., in September 1961. At the Washington sessions, many scientists expressed the belief that diets deficient in animal protein could be fully corrected by adding from 3 to 10 percent fish flour.

At the close of the meeting a panel of experts, convened by FAO, recommended a long-range program on fish flour research and human feeding studies and asked member nations to volunteer to supply the fish flour needed for the feeding program. The panel also recommended that FAO determine where the feeding studies were to be made. Chile and Peru have offered to furnish facilities for manufacturing the fish flour and have been selected as the countries where the first feeding studies will be made.

The Department has assigned a technologist of the U. S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md., to assist in this program. The Bureau technologist went to South America and worked with the Chief of the Economic Branch of the Fisheries Division, FAO, Rome, in inspecting fish flour facilities offered by the two Latin American countries and recommending whatever mechanical or manufacturing changes may be necessary to supply the types of protein concentrate needed in the study.

After completing his FAO assignment in Chile and Peru, the Bureau technologist inspected other laboratories and processing plants in South America where fish protein concentrates are being developed. He observed processes in Uruguay. Also, he visited the University of Concepcion in Chile, where fish flour problems are being studied. He consulted with authorities at a Government hospital in Guatemala, where important work on the use of incaparina, a compounded protein food made from locally-available vegetable matter, is being carried out. He stopped in San Salvador to review studies on the use of fish flour as a food supplement in attempts to prevent or cure kwashiorkor, a devastating protein-deficiency disease.

In addition to assisting in the FAO study in Latin America, the Bureau technologist collected information regarding fish flour technology and utilization. This will be valuable to research now under way at the Bureau's College Park Technological Laboratory.



Frozen Fish Distribution

TIME-TEMPERATURE STUDIES IN DISTRIBUTION CHANNELS:

Temperature fluctuations of frozen fishery products in distribution channels are being studied by the Gloucester Technological Laboratory of the U. S. Bureau of Commercial Fisheries with the cooperation of the Food Technology Department of the University of Massachusetts.

Arrangements have been made to ship recording thermometers and time-temperature indicators through several distributor-to-retailer channels in the Boston and Gloucester (Mass.) areas and also from warehouses in Hartford, Conn., and Pittsfield, Mass., to retail stores in the northwestern part of Massachusetts. The instruments will be collected at retail stores in various parts of Massachusetts by the University staff who will monitor the temperature of the shipments and provide the Gloucester Laboratory with the data obtained.



Great Lakes

NEW BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL BASE IN LAKE MICHIGAN:

Two U. S. Bureau of Commercial Fisheries research vessels arrived at the port of Saugatuck, Mich., on the eastern shore of Lake Michigan in late November 1961. The biological research vessel Cisco, previously based at Bay City, on Saginaw Bay, Mich., has worked intermittently in Lake Michigan since she was constructed in 1951. The exploratory fishing and gear research vessel Kaho is new, having been accepted from the builders in Toledo, Ohio, just prior to sailing for Saugatuck.

The Saugatuck base, not yet fully completed, will serve as "home port" to these vessels while they take part in scientific programs on the commercial fisheries of the Great Lakes. Saugatuck was chosen as base of operations because of its relatively ice-free winter conditions and its accessibility to Ann Arbor from where Great Lakes research is directed.

The biological research vessel Cisco (a name applied collectively to several species

of Great Lakes whitefish), is of all-steel construction and 65 feet in length, with a 16-foot beam and draft of 7½ feet. She is powered by a 170-hp. Diesel engine and cruises at 10½ m.p.h. The Cisco has accommodations for 4 crew members and 5 scientists.

The Kaho (name derived from Chippawa Indian word for "hunt"), especially designed for exploratory fishing and gear research activities, is also of all-steel construction, with the exception of an aluminum pilothouse. She is 65 feet in length with an 18-foot beam and draft of 7 feet. The Kaho is powered by twin 150-hp. Diesel engines, and has a cruising speed of over 12 m.p.h. The Kaho accommodates a crew of 4 plus 3 scientists at present.

Both vessels are fitted with modern navigation, communication, research, and fishing equipment. Special electronic instruments furnish data on water depth, bottom condition, and subsurface fish distribution; and provide for positioning the vessels accurately on selected fishing or testing stations. Other scientific equipment records water temperatures from lake surface to bottom, recovers water samples simultaneously from various depths, and obtains samples of lake bottom material.

The Cisco has just completed a 2-year study of the status of the chub stocks of Lake Michigan to measure changes that have resulted from decreased predation by the lake trout, and increased predation by the sea lamprey. The small chubs, which were the principal food of lake trout and too small to be attacked by the sea lamprey, are even more abundant than they were during a similar survey in 1954-55.

During the next few years the Cisco will be used primarily in research on Lake Michigan. She will be used in fishery and environmental studies to learn more about factors that influence the abundance, growth, distribution, and movements of commercially important fish. This information should help to develop optimum utilization of the fishery resources of the lake.

The Kaho will be used in studies designed to help Great Lakes commercial fishermen adjust to the changes in fish populations that have resulted from altering environmental conditions and the invasion of the notorious

sea lamprey. Traditional Great Lakes fishing methods were practical when the bulk of commercial catches consisted of such valuable species as lake trout, whitefish, yellow pike, and the larger chubs. To realize profitable fishing on the less valuable species that are now available in great numbers, but are largely underutilized, much more efficient methods are necessary.

Since 1958, the Bureau's Exploratory Fishing and Gear Research, working in Lake Erie with a converted trap net vessel and in Lake Michigan with chartered vessels, has determined that the trawl method of fishing is very effective for taking such plentiful species as chubs, alewife, and smelt. This work will be continued more intensely and primarily in Lake Michigan in the immediate future by the Kaho. The seasonal availability of underutilized species will be determined by area and depth. Standard commercial types and sizes of trawl nets will be used to obtain the vital information. The results will indicate where and when the best fishing is to be expected.

These biological and exploratory fishing activities are part of an integrated Bureau program which also includes studies in processing, marketing, economics, and statistics of commercial fish. The objective of all this attention to Great Lakes commercial fisheries is to determine the extent and characteristics of Great Lakes commercial fish resources and how to best utilize them at a sustained level in complete harmony with other industrial and recreational uses of those waters.



Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION SURVEY FOR 1961 SUMMARIZED:

The schedule of the U. S. Bureau of Commercial Fisheries research vessel *Musky II* for November 1961 was reduced in part because of adverse weather and partly to allow time for the annual fall collection of scale samples from fish in the commercial catch. In this final report, the Bureau's biological research on Lake Erie for 1961 is briefly summarized.

A rescheduling of vessel operations early in 1961 permitted staff limnologists to con-

duct special studies aboard the *Musky II* during one or two weeks a month. Consequently, data on certain physical, chemical, and biological features (temperatures, pH, alkalinity, dissolved oxygen, plankton, and bottom fauna) of the waters of the western basin were collected on a seasonal basis. Special attention was given to low concentrations of dissolved oxygen in the deeper areas of the central basin during midsummer.

Fishery and limnological studies were combined during several cruises. One of these was the annual summer cruise to seven established index stations in the western basin of Lake Erie, and another was a two-week cruise into eastern Lake Erie and western Lake Ontario in late September. The visit to Lake Ontario was the first by a Bureau research vessel.

Fishery operations for 1961 were begun during the first week of April. During the season, experimental trawling was accomplished at 20 different stations on a total of 73 separate vessel trips. Two stations were visited semimonthly to gather pertinent data on abundance, distribution, and seasonal growth of fish. A consecutive three day-night trawling series was conducted at two stations (Bono and East Harbor) during the spring, summer, and fall. Data from collections during the three seasonal series will be tabulated to provide information on the degree of variability among catches in a given area over a short period of time. The data will also contribute to the life-history studies for the various species. Gill-net operations in 1961 were limited to a few overnight sets in the Island region early in the year.

The hatch and survival for the majority of species in Lake Erie appeared to be much better in 1961 than in 1960, although not as successful as in 1959. White bass, yellow perch, and spot-tail shiners were generally plentiful, but catches of young fish of other species were somewhat sporadic.

The cooler water temperatures which prevailed during 1961 apparently influenced the growth rate of numerous species. A retardation of growth of young-of-year fish was clearly apparent by the end of year. Average lengths in inches of young fish in western Lake Erie, at the end of the growing season, were as follows: yellow pike or

walleye, 8.6; yellow perch, 3.5; white bass, 3.4; sheepshead, 3.8; gizzard shad, 3.9; alewife, 4.2; spot-tail shiner, 3.0; emerald shiner, 2.6; and channel catfish, 3.1.

The current status of the yellow pike tagging program is as follows: Of 4,000 yearling yellow pike tagged in the spring of 1960, 447 (11.2 percent) have been recaptured to date--334 in 1960 and 113 in 1961. The 1961 recoveries demonstrated a pronounced movement of yellow pike to the extreme western end of Lake Erie and northward.

Sampling of the major species of fish in the commercial catch was undertaken in the spring and fall. Scale samples were obtained from a total of 3,242 specimens. Yellow perch, white bass, and sheepshead were readily available, but yellow pike catches continued to drop, and other high-value species such as blue pike, whitefish, and ciscoes have practically disappeared from the catch.

The Musky II was placed in dry dock for the winter.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 17-18.

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LAKE MICHIGAN FISH POPULATION SURVEY FOR 1961 COMPLETED:

M/V "Cisco" Cruise 9 (October 31-November 13, 1961): Operations of the U. S. Bureau of Commercial Fisheries research vessel Cisco during cruise 9 were seriously curtailed by almost continuous heavy seas. Scheduled work off Sturgeon Bay, Wis., and Frankfort, Mich., was cancelled.

Standard gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, 100 feet of 2-inch mesh, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{1}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Charlevoix, Mich., and off Manistique, Mich. All sets were in areas where the water was homothermous (or nearly so); bottom temperatures were 45° to 50° F. (several degrees warmer than during the summer).

Chubs (Leucichthys hoyi), smelt, and alewives were the predominant catches in the Charlevoix area--chubs and alewives at 50 fathoms and smelt at 25 fathoms. In the Manistique area, catches consisted primarily of smelt, chubs, and alewives at 25

fathoms, and chubs, deep-water sculpins, alewives, and smelt at 50 fathoms.

Thirty-minute tows were made with a 50-foot balloon trawl at 15, 25, 35, and 50 fathoms off Manistique, and at 30 fathoms in Little Traverse Bay, east of Charlevoix. Chub catches were 15, 54, 194, 65, and 102 pounds, respectively. All catches contained alewives (11 to 45 pounds) and smelt (up to 287 pounds at 15 fathoms off Manistique). Ninespine sticklebacks (up to 1,000 per tow) were taken in all catches except at 15 fathoms off Manistique, and trout-perch were taken in 3 tows (including the tow at 50 fathoms). Twenty small whitefish (mostly 8 to 9 inches long) were caught in the 15-fathom tow off Manistique. This catch of young whitefish was the largest ever made by the Cisco. Other species in the trawl catches were deep-water sculpins (up to 52 pounds), slimy sculpins, and (in the tow in Little Traverse Bay) spot-tail shiners. The occurrence of sticklebacks, trout-perch, and spot-tail shiners in deep water may be attributed to the general uniformity of the water temperature.

Hydrographic collections and observations were made at 40-fathom stations off Charlevoix, off Manistique, and in midlake between the two ports. The fall overturn was in progress and homothermous conditions prevailed to depths as great as 50 fathoms. Surface water temperatures off Charlevoix were about 11.8° C. (53.2° F.) at the beginning of the cruise and 10.0° C. (50.0° F.) at the end. Extremes recorded in the open lake were 7.0° C. (44.6° F.) and 12.0° C. (53.6° F.).

M/V "Cisco" Cruise 10 (November 21-26, 1961): This short cruise was the last for the 1961 season. The vessel was taken to her new winter berth in Saugatuck, Mich., after the scheduled operations had been completed.

Regular gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, 100 feet of 2-inch mesh, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{1}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25, 50, and 80 fathoms off Frankfort, Mich. Catches consisted mostly of chubs (Leucichthys hoyi), alewives, and lake herring at 25, 50, and 80 fathoms. The L. kiyi, L. alpenae, L. zenithicus, and lake herring appeared to be at the beginning of their spawning season. Only one spent fish, a L. kiyi, was taken, but all other individuals of these species were ripe, or nearly so. A

burbot, which weighed 2 lbs. 10 oz., was the second caught by the Cisco this year. It bore no lamprey scars.

The customary data were collected at the 40-fathom hydrographic station off Frankfort. Bathythermograph casts were made at 5-mile intervals from Charlevoix, Mich., to Frankfort. Surface water temperature ranged from 5.8 to 8.9° C. (42.4 to 48.0° F.). Slight thermal stratification still remained at depths greater than about 25 fathoms.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 18-19.

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WHITEFISH SPAWNING POPULATIONS ASSESSED IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR:

M/V "Siscowet" Cruise 9: The annual assessment of whitefish spawning activities in the Apostle Islands region was made November 17-22, 1961. Large-mesh gill nets (4½- to 5½-inch mesh) fished at depths of 1 to 4 fathoms on spawning grounds off Rocky and Cat Islands yielded 82 ripe whitefish (71 males, 11 females). Only 1 whitefish was found to bear a sea lamprey scar (healed). Biologists tagged and released 72 of these fish.

The primary reason for tagging the spawning whitefish was to determine whether the fish have a "homing" instinct, i.e., return to the same spawning grounds each year. Over 50 spawning whitefish were tagged on Rocky and Cat Island Shoals in 1960 but none were recovered during cruise 9. (Of the fish tagged in 1960, 22 percent were captured during the year by commercial fishermen.)

Small-mesh gill nets (150 feet each of 1½- and 2½-inch mesh) were also fished on the whitefish spawning grounds. Longnose suckers, round whitefish, and lake herring predominated in the catches. Stomachs from fish of each species were examined, but only the longnose suckers contained fish eggs (presumably of whitefish).

Trawl tows in the Apostle Islands area yielded 82 small lake trout, of which 81 were fin-clipped. Of these hatchery-reared fish, 60 were from the 1961 Bayfield spring plant, 16 from the 1960 spring plant, 3 from the 1960 fall plant, and 2 from the 1959 spring plant. Other species taken in the trawl included smelt, pygmy whitefish, sculpins,

alewives, and sticklebacks. Young-of-the-year alewives were taken in most of the trawl tows, and appeared to be distributed throughout the island area at depths of 17 to 29 fathoms. These catches were of special interest because young-of-the-year alewives had not previously been collected by the Siscowet in Lake Superior.

Water temperatures on the whitefish spawning shoals ranged from 41.0° F. to 42.4° F. The water was nearly homothermous at all depths.

Note: See Commercial Fisheries Review, Jan. 1962 pp. 19-20.



Groundfish

FORECAST OF ABUNDANCE ON NEW ENGLAND BANKS IN 1962:

Little change is expected in the abundance of groundfish on New England fishing banks during 1962. Biologists at the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, who keep an eye on the fluctuating abundance of the commercially-important species in that area, have this to say for the coming year. Georges Bank haddock, the most important fish in the area, is expected to remain in moderate supply throughout 1962. Scrod will make up a good portion of the catch. This scrod will come mostly from the 1959 age group. The picture for 1963 is not quite so bright for Georges Bank haddock since there are no strong age groups following that of 1959. Bureau surveys indicate a weak 1960 age group and practically no show of the 1961 group.

Other important species such as cod, ocean perch, and whiting are expected to remain moderately abundant as during 1961. Although detailed biological information is not available for those species, as it is for haddock, there is no reason to believe there will be any significant change in their abundance in 1962.

Yellowtail flounder is presently enjoying a high level of abundance. It will remain high during 1962 although there will be a slight drop from the levels of the past two years.

Sea scallops also have been in unusual abundance during the last two years. In 1962 abundance is expected to remain

high, but at levels somewhat below that of 1961.



Gulf Exploratory Fishery Program

EXPERIMENTAL MIDWATER TRAWL TESTED AND SHRIMP AREAS EXPLORED:

M/V "Oregon" Cruise 76: This cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was conducted in five intermittent phases from September 20 to December 17, 1961. Specific objectives were to: (1) obtain further performance data on experimental midwater trawls, (2) take motion pictures of escape-behavior of various pelagic fishes, and (3) explore the outer shelf areas of the north-central and north-western Gulf for commercial concentrations of brown shrimp (*Penaeus aztecus*).

The phases were planned to permit exploratory shrimp trawling during nighttime and midwater trawling trials and underwater motion picture work during daylight hours. A total of 90 shrimp trawl drags and 37 midwater trawl tows were completed during the cruise.

Performance data were obtained on two midwater trawls of different design, various flotation and depressor devices, four corner elevator-depressors, and three different types of doors. Of particular interest was the performance of a trawl of new design, which permitted towing speeds up to 5 knots

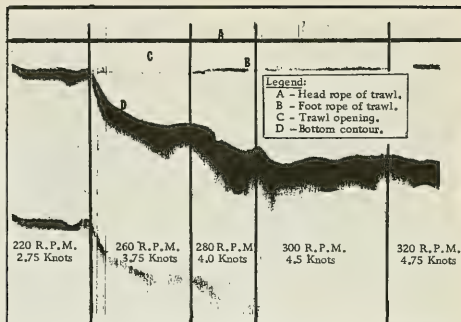


Fig. 2 - Pascagoula High-Speed Trawl: Note stabilized vertical opening of trawl through indicated speed range.

with no apparent reduction in the vertical opening of the trawl. The echographs (figs. 1 and 2) show the relation between speed and vertical opening for both the British Columbia-type trawl and the experimental Pascagoula high-speed trawl.

A headrope-mounted sonic transducer and two remote-controlled motion picture cameras--one mounted on the headrope and one in the funnel--were used to record trawl configuration and fish behavior and to enable exact vertical positioning of the trawl. Approximately 2,000 feet of 16 mm. film were exposed during the cruise, resulting in approximately 500 feet of intelligible film.

Only slight-to-moderate depth-sounder indications of pelagic fish schools were encountered during this period. Midwater trawl catches were generally small, ranging from a few hundred pounds to 1,500 pounds (heads on) per tow. The catches were comprised predominantly of butterfish (*Poronotus triacanthus*) and harvestfish (*Peprilus paru*). The echograph reproduction in figure 3 shows concentrations of butterfish entering the trawl mouth.

At the further request of members of the Gulf shrimp industry, three phases of the cruise were concerned with exploration for brown shrimp in the 20- to 60-fathom depth range both east and west of the Mississippi Delta. This work was a follow-up to earlier shrimp exploratory work which was reported in Oregon Cruise Reports 75 and 76A.

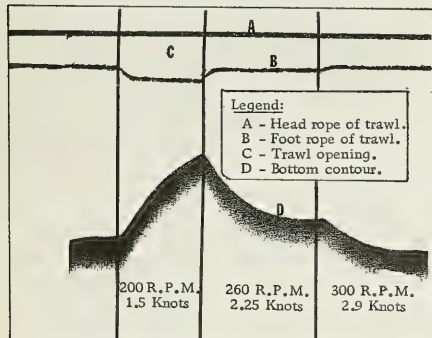


Fig. 1 - British Columbia-Type Trawl: Note inverse relationship between vessel's speed and vertical opening of net.

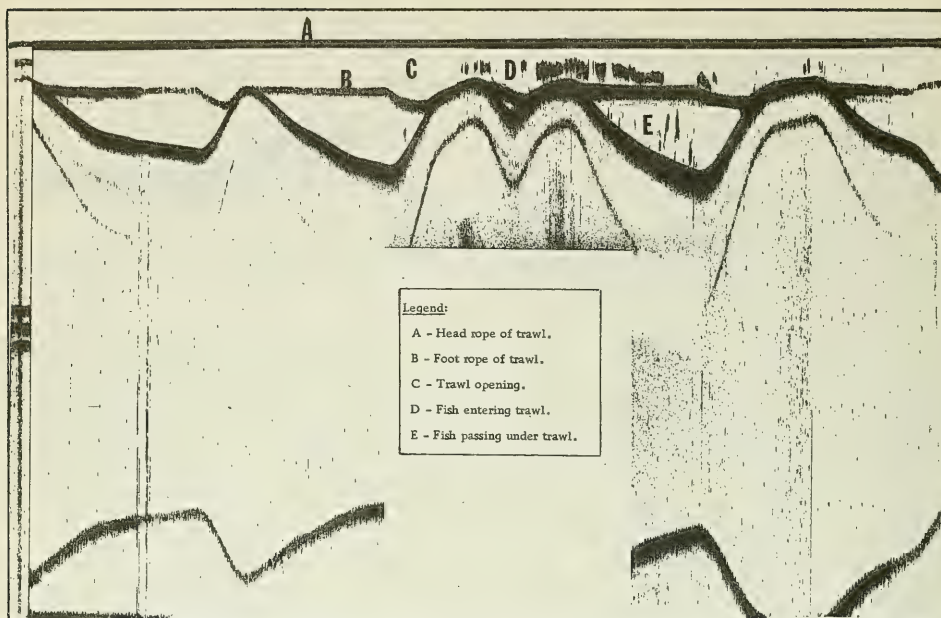


Fig. 3 - Fish entering trawl between head and foot rope of midwater trawl. Apparent uneven bottom contour resulted from variable speeds necessary for positioning trawl to intercept fish schools.



Fig. 4 - M/V Oregon Cruise 76 (Oct. 2 - Dec. 17, 1961).

A total of 90 exploratory drags (85 at night) were completed between the Mississippi Delta and Sabine Pass, Texas, and between the Delta and Pensacola, Florida, in this depth range.

With the exception of three areas which produced marginal commercial catches, no important concentrations of brown shrimp were located. The three areas of marginal production were located: (1) in 18-22 fathoms 20 miles northeast of Pass-a-Loutre whistle buoy #4 (lat. $29^{\circ}33' N.$, long. $88^{\circ}36' W.$), (2) in 40 fathoms 17 miles east by north of Pass-a-Loutre whistle buoy #4 (lat. $29^{\circ}13' N.$, long. $88^{\circ}37' W.$), and (3) in 31 fathoms 43 miles WSW. of Ship Shoal whistle buoy #2 (lat. $28^{\circ}24' N.$, long. $91^{\circ}48' W.$). In these areas drags with a single trawl (40-ft. balloon and 70-ft. flat trawls were used) produced 15-20 count brown shrimp at a rate of 40 to 50 pounds (heads-off) per 3-hour tow. Other areas test-fished produced large brown shrimp at rates of 2 to 5 pounds per one-hour tow.

Extensive areas of foul bottom were found in the 50- to 60-fathom depth range. Most attempts to sample these areas resulted in moderate to severe gear damage. Figure 4 denotes areas of foul bottom and the location of exploratory shrimp drags.

Note: See *Commercial Fisheries Review*, Dec. 1961 p. 31; Nov. 1961 p. 23.



Gulf Fishery Investigations

SEA-WATER LABORATORY DEDICATED:

A new sea-water laboratory, an adjunct to the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Tex., was dedicated on December 7, 1961. The new facility, together with the recently completed sea water system in the main laboratory, will make it possible to solve many perplexing fishery problems. In the new sea-water laboratory, fish and shellfish will be held in water taken directly from the sea. At the main laboratory the sea water is filtered and recirculated to provide a constant environment. The two systems will enable scientists to set up experiments which will duplicate many conditions in nature.



Fig. 1 - Bureau of Commercial Fisheries new sea-water (continuously circulating) laboratory located on East Beach Lagoon, Galveston, Tex.

In an address at the dedication Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, said: "The ultimate aim of our research here is to discover the biological facts which regulate the survival, growth, movement, and reproduction of shrimp and other estuarine forms. Only through such knowledge can we perceive the means of managing our fisheries for the welfare of the industry and of the Nation... "

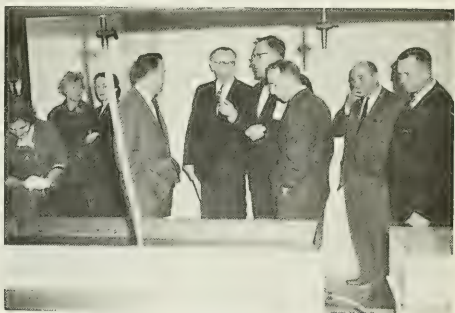


Fig. 2 - Inside the new sea-water laboratory showing some of the participants in the dedication ceremonies.

Studies of the sea are extremely difficult. Fish and shrimp are seldom seen near the surface and, therefore, they must be caught by dragging nets blindly across the bottom and bringing them to the surface for observation.

One way to learn more about the species which live in the sea is to create a miniature ocean in a place where direct observations conveniently and safely may be made. This is what has been provided the Galveston Laboratory--a small portion of the sea where fish and shellfish can be kept and their behavior studied to determine the kind of environment which they require.

The Galveston Laboratory is studying shrimp, the most valuable species landed by United States fishermen. Shrimp spawn at sea and their young somehow move shoreward into coastal bays and estuaries. At present, how these tiny shrimp can move such great distances is not fully understood.

This new sea water system will make it possible to rear young shrimp in captivity where they can be studied in minute detail. In this way, it may be possible to determine the effects of tides, currents, and other factors on the movement of young shrimp and to find the clues which will make it possible to solve this mystery.

In other experiments, the Laboratory hopes to improve the methods for marking shrimp and various fish so that their migration can be followed and their survival rates determined.

Construction of this sea-water laboratory is one of the ways in which the Fish and Wildlife Service is participating in the expanded national oceanographic program. Much of the research to be conducted will concern the behavior of fish and shellfish and contribute to our knowledge of these inhabitants of the sea.

Biologists designed this sea-water system with the greatest degree of simplicity to reduce inception and growth of fouling organisms. The sea-water piping is made of strong plastics to prevent metal contamination. The water is first pumped to the 25,000-gallon roof tanks by two 500-gallon-per-minute pumps. Thence, it flows by gravity into the main tank room.

The roof is of prestressed concrete tees to eliminate any pillars in the tank room. Permanent tanks were purposely omitted to provide for maximum flexibility of use, as new experiments require modifications in size and shape of tanks.

The instrument room provides for constant recording of both weather and seawater characteristics so that investigators will be constantly aware of changing conditions, and a continuous record will be available to apprise the biologists of both short- and long-term trends in any of the physical or chemical characteristics.

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TWO VESSELS CHARTERED FOR SHRIMP RESEARCH PROGRAM:

Bids for the charter of two fishing vessels with crews were opened on December 20, 1961. The U.S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas, will use the vessels for the expanded Federal shrimp research program under way at the Galveston Laboratory.

The specifications for the vessels were: length 60 feet and maximum over-all length 90 feet. The Government guarantees charter of not less than 35 calendar days for each vessel in each six months of calendar year 1962. Five bids were received.

Contracts were awarded to the two lowest bidders for the charter of the Belle of Texas and the Miss Angela. A previous charter contract was awarded to the Belle of Texas in August 1961.

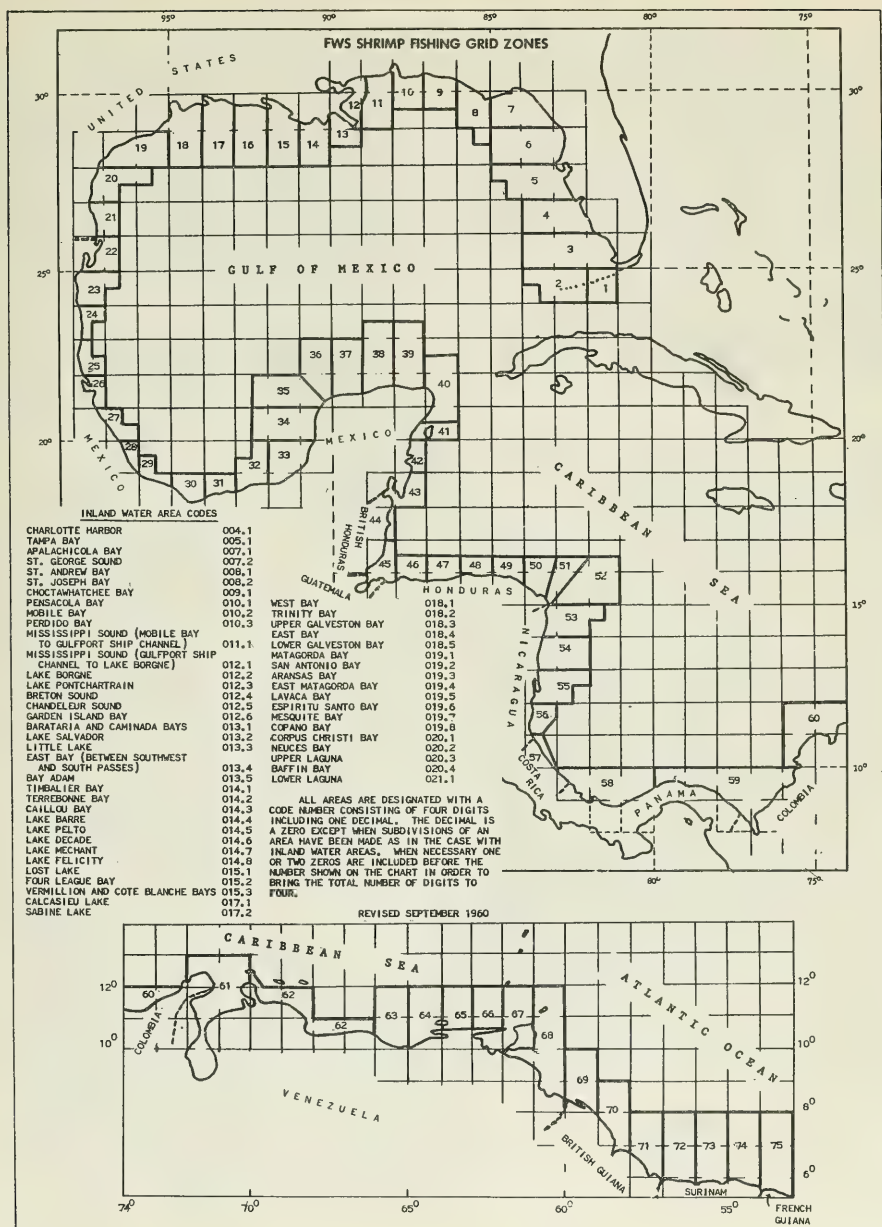
Note: See Commercial Fisheries Review, Oct. 1961 p. 20.

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SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruises BT-12, BT-13, BT-14: Between December 5 and 7, 1961 (cruise BT-12), 6 tows in each of two statistical areas (FWS fishing grid zone 15 and 16) were made with a 45-foot shrimp trawl by the U. S. Bureau of Commercial Fisheries chartered research vessel Belle of Texas. In each statistical area two tows were made in each of three depth ranges--0-20 fathoms, 20-40 fathoms, and 40-60 fathoms. The vessel is operated by the Bureau's Biological Laboratory in Galveston, Tex. The tows yielded only very small quantities of shrimp.

Ten tows were made between December 15 and 17, 1961 (cruise BT-13), with the same type of gear, in two other statistical areas (FWS zone 17 and 18). Due to rough seas only one station in the 40-60 fathom



range was fished in one of the areas. One station in each statistical area was in the 20-40 fathom range. Three stations in one area and 4 stations in the other were in the 0-20 fathom range. Very small quantities of shrimp were caught.

Six tows in each of the two statistical areas (FWS zone 19 and 20) were made December 18-21, 1961 (cruise BT-14). Two tows were in each of three depth ranges (0-20 fathoms, 20-40 fathoms, and 40-60 fathoms) fished in each statistical area. Although more shrimp was caught on this cruise than in the previous two cruises, the amount was still small.

Note: See Commercial Fisheries Review, Jan. 1962 p. 20; Dec. 1961 p. 33.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-NOVEMBER 1961:

Landings of skipjack tuna in Hawaii during November 1961 were about 235,000 pounds, or about 100,000 pounds below the 1948-60 average landings for the month.

The number of successful trips by Oahu boats (37) in November was less than half the number for October. Catch per successful trip decreased by about 1,000 pounds in November as compared with October. The decrease in trips may be partly due to rough sea conditions, as small craft and storm warnings were issued on a few occasions during the month.

The landings during November were composed of 35.6 percent small (less than 8 lbs.), 49.6 percent medium (8-15 lbs.), and only 15.1 percent large (more than 15 lbs. each) skipjack. This shows a decrease in the proportion of large fish as compared to October, when 41 percent of the landings were of skipjack 15 pounds or more in weight.

Total estimated landings for January-November 1961 were 11.1 million pounds, about 1.5 million pounds above average.



Industrial Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-October 1961: Based on domestic production and imports, the United States supply of fish meal for the first 10 months of 1961 amounted to 434,100 tons--67,000 tons or 18 percent above the same period of 1960. The domestic production was 8,300 tons and imports 58,700 tons greater than the 10-months period of 1960. Imports from Peru continued to lead--totaled nearly 110,700 tons during the first 10 months of 1961.

U. S. Supply of Fish Meal and Solubles, January-October 1961 and Comparative Data			
Item	January-October		Total
	1961	1960	1960
<u>Fish Meal and Scrap:</u>	..... (Short Tons)		
<u>Domestic production:</u>			
Menhaden	230,486	204,184	218,423
Tuna and mackerel ..	17,191	22,582	26,499
Herring, Alaska	3,576	6,103	6,103
Other	14,244	24,323	39,112
Total production ...	1/265,497	1/257,192	290,137
<u>Imports:</u>			
Canada	33,559	28,790	30,982
Peru	110,682	54,570	68,156
Chile	10,078	16,672	21,183
Angola	1,543	360	888
Republic of So. Africa,	11,376	6,321	7,073
Other countries	1,327	3,135	3,279
Total imports,	168,565	109,848	131,561
Available fish meal supply	434,062	367,040	421,698
<u>Fish Solubles:</u>			
Domestic production 2/	100,021	92,508	98,929
<u>Imports:</u>			
Canada	880	809	869
Denmark	28	1,858	1,858
Other countries	1,710	165	447
Total imports	2,618	2,832	3,174
Available fish solubles supply	102,639	95,340	102,103
1/ Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.			
2/ 50 percent solids. Includes production of homogenized condensed fish.			

All factors indicate that the total United States supply of fish meal in 1961 will ex-

ceeded the peak year of 1959 when the quantity amounted to nearly 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1961 totaled 102,600 tons--7,300 tons more than during the same period in 1960. Solubles and homogenized fish manufactured from domestically-caught fish made up 97 percent of the 10 months' supply in 1961, while 3 percent of the supply was imported.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, January-November 1961: In November 1961, 10,100 tons of fish meal and scrap and 1.4 million gallons of marine animal oils were produced in the United States.

Compared with the same month of 1960, this was a drop of 1,000 tons (9 percent) in meal and scrap and 248,000 gallons (15 percent) in oil. Menhaden accounted for 6,800 tons or 68 percent of the meal total, and 1.2 million gallons or 90 percent of the oil production. There were 4,200 tons of fish solubles produced in November--750 tons above the same month of 1960. The production of homogenized condensed fish amounted to nearly 1,000 tons--about 900 tons more than in November 1960.

During the first 11 months of 1961, meal and scrap production of 276,000 tons was 5,500 tons above the same period of 1960. The marine animal oil yield of 31.9 million gallons was 5.1 million gallons more than in the first 11 months of 1960.

U. S. Production of Fish Meal, Oil, and Solubles, November 1961 ^{1/} with Comparative Data					
Product	November		January-November		Total
	1961	1960	1961	1960	1960
..... (Short Tons)					
Fish Meal and Scrap:					
Alewife	-	-	89	1,092	1,092
Herring:					
Alaska	-	-	3,576	6,103	6,103
Maine	99	81	1,149	2,693	2,915
Menhaden 2/	6,800	8,357	237,286	212,541	218,423
Sardine, Pacific	697	603	2,094	2,934	3,508
Tuna and mackerel	1,998	1,381	19,189	23,963	26,499
Unclassified	464	664	12,172	20,680	21,288
Total	10,058	11,086	275,555	270,006	279,828
Shellfish and marine animal meal and scrap ..	3/	3/	3/	3/	10,309
Grand total meal and scrap	3/	3/	3/	3/	290,137
Fish solubles	4,203	3,453	93,737	86,564	89,377
Homogenized condensed fish	950	71	11,497	9,468	9,552
..... (Gallons)					
Oil, body:					
Alewife	-	-	6,900	73,950	73,950
Herring:					
Alaska	-	-	625,786	1,385,218	1,385,218
Maine	4/	2,680	4/	132,973	132,973
Menhaden 2/	1,223,646	1,515,864	29,461,595	23,497,283	24,453,736
Sardine, Pacific	20,923	15,184	56,166	138,611	160,121
Tuna and mackerel	85,091	46,031	671,951	459,877	509,195
Other (including whale)	30,173	28,464	1,057,039	1,108,727	1,137,782
Total oil	1,359,833	1,608,223	31,881,437	26,796,639	27,852,975
1/ Preliminary data.					
2/ Includes a small quantity produced from thread herring.					
3/ Not available on a monthly basis.					
4/ Included in "Other" in order to avoid disclosure of the production of individual firms.					
Note: Excludes liver oils.					

Imports of fish meal during January-October 1961 of 168,900 tons were 54 percent greater than during the same period of 1960. Imports of fish solubles were 200 tons less. Exports of fish oils and fish liver oils during the first 10 months of 1961 amounted to 110.6 million pounds (14.7 million gallons)--2.6 million pounds (350,000 gallons) less than in the same period of 1960.

* * * * *

MAJOR INDICATORS FOR U. S. FISH MEAL, SOLUBLES, AND OIL, DECEMBER 13, 1961:

Fish Meal Production and Imports				
Item and Period	1961	1960	1959	1958
	..... (Short Tons)			
Production:				
December	1/	9,185	14,361	14,636
November	10,500	8,725	10,797	9,749
January-November 2/	276,000	251,211	261,015	201,536
January-December *	1/	257,959	275,396	226,299
January-December **	1/	290,137	306,551	248,140
Imports:				
December	1/	15,564	5,538	8,490
November	1/	6,149	3,673	6,082
October	9,425	12,515	3,821	5,899
January-October ..	168,565	109,848	123,744	85,780
Jan.-Dec. Totals ..	1/	131,561	132,955	100,352
Fish Solubles Production and Imports				
Item and Period	1961	1960	1959	1958
	..... (Short Tons)			
Production 3/:				
December	1/	2,897	5,430	6,305
November	4,000	3,542	4,628	8,888
January-November ..	93,500	96,032	159,929	123,872
Jan.-Dec. Totals ..	1/	98,929	165,359	130,177
Imports:				
December	1/	60	420	5,180
November	1/	282	3,089	867
October	110	-	1,908	2,548
January-October ..	2,618	2,832	23,121	8,520
Jan.-Dec. Totals ..	1/	3,174	26,630	14,567
Fish Oil Production and Exports				
Item and Period	1961	1960	1959	1958
	..... (1,000 Gallons)			
Production:				
December	1/	1,038	1,865	1,839
November	1,346	1,202	1,147	1,028
January-November ..	32,000	25,643	22,546	19,786
January-December *	1/	26,690	24,418	21,957
Jan.-Dec. Totals **	1/	27,886	24,978	22,028
Exports:				
December	1/	2,108	2,611	383
November	1/	1,952	813	2,037
October	2,027	591	1,911	3,591
January-October ..	14,744	15,095	15,840	10,119
Jan.-Dec. Totals ..	1/	19,155	19,264	12,539

1/Not available.

2/Does not include crab, shrimp, and miscellaneous meals.

3/Includes homogenized fish.

4/Represents over 95 percent of the total production.

Note: Data for 1961 are preliminary.

*Totals based on preliminary monthly data.

**Final annual totals.

North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER:

M/V "Commando" Cruise 3: The third in a series of cruises designed to monitor deep-water marine fauna at stations established along a track line southwest of the mouth of the Columbia River was completed on December 13, 1961, by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Commando. Inclement weather prevented a systematic survey of the stations from shallow to deep areas as in previous cruises; however, adequate coverage was obtained from 12 otter-trawl hauls made in 50 to 450 fathoms of water.

The cooperative study with the Oregon Fish Commission of Dover sole migrations was continued with release of 70 tagged fish at the 300-fathom station.

Commercial species of fish encountered were the same as those taken in previous cruises, including sablefish (Anoplopoma fimbria), Dover sole (Microstomus pacificus), English sole (Parophrys vetulus), petrale sole (Eopsetta jordani), turbot (Atheresthes stomias), hake (Merluccius productus), and several species of rockfish. Dover sole and sablefish were found throughout the depth range fished. Dover sole was most abundant between 200 and 300 fathoms, while most of the sablefish were taken between 300 and 400 fathoms. Although as much as 1,300 pounds of sablefish per hour tow were caught, a large percentage of the take was under marketable size. The largest catch of ocean perch (Sebastes alutus) was made at 150 fathoms. Very few hake were taken during the survey which is in contrast to the September cruise when large concentrations were found down to a depth of 200 fathoms.

Tanner crabs (Chionoecetes tanneri) appeared in greatest abundance at 375 fathoms where 360 pounds were taken in a one-hour tow. One male tanner crab was caught in 150 fathoms which is 100 fathoms shallower than any of either sex taken in previous cruises.

Invertebrates encountered during the cruise and not in previous cruises were barnacles and a species of crab similar in appearance to a king crab.

Note: See Commercial Fisheries Review, Nov. 1961 p. 26.



Oceanography

ALUMINUM SUBMARINE FOR OCEANIC RESEARCH:

An aluminum research submarine designed to explore the ocean at depths many times beyond the limit of existing subs is being built for Reynolds International, Inc., by General Dynamics Corporation's Electric Boat Division, according to a joint announcement by the two firms.

The Chairman of Reynolds International, Inc., a subsidiary of Reynolds Metals Company, and the Chairman of General Dynamics on September 27, 1961, announced the signing of a \$2-million design and construction contract for the Aluminaut--first submarine ever to be constructed from aluminum.

The Woods Hole Oceanographic Institution (Massachusetts) will operate the sub as part of a research program sponsored by the Office of Naval Research (ONR), United States Navy. Most of the construction costs incurred by Reynolds will be recovered through lease of the craft for oceanographic research.

The Aluminaut is being built at the Electric Boat Division in Groton, Conn., and launching is scheduled for 1963. A pioneer in submarine construction, General Dynamics has built 10 of the Navy's 21 commissioned atomic subs. These include the Nautilus, first nuclear sub, and the George Washington, first of the Polaris subs.

Designed to operate at depths of 15,000 feet--almost three miles down--the Aluminaut will permit man to explore about 60 percent of the world's ocean floor--most of it for the first time.

The Aluminaut is scheduled to be equipped with sonar, television cameras for detailed observation of the ocean floor, and robot hands to obtain specimens.

Displacing 150,000 pounds, the Aluminaut will be slightly over 50 feet long with an 8-foot diameter hull. Separate electrical propulsion systems will give the three-man craft both horizontal and vertical locomotion. Its operating range will be about 80 miles.

The sub's hull is being constructed by bolting together large, one-piece cylindrical sections of high-strength aluminum forgings.

The world's largest aluminum ingot was cast for the first hull section.

Aluminum was chosen because it is three times lighter than steel and has greater strength for its weight than other available metals. This allows fabrication of a hull thick enough to withstand tremendous pressures at great depths, yet light enough to stay afloat without external buoyancy.

The Director of Woods Hole Oceanographic Institution said: "We plan to use the Aluminaut to extend our capabilities for a wide variety of geological, biological, and physical research work on the bottom and in the mid-depths. Among the subjects our scientists will study are the submarine canyons, the edge of the continental shelf, and the daily vertical migration of marine animals."

The Aluminaut is the outgrowth of research which has been carried out for several years by Reynolds Metals Company, Southwest Research Institute, General Dynamics' Electric Boat Division, Woods Hole Oceanographic Institution, and the Office of Naval Research.

* * * * *

NEW EDUCATIONAL FILMSTRIP "DEEP FRONTIER--AN INTRODUCTION TO OCEANOGRAPHY":

A limited number of copies of "Deep Frontier--An Introduction to Oceanography," a narrated color filmstrip designed particularly for high school and university science classes, is being offered by the U. S. Department of the Interior without charge to State education departments and interested institutions of higher learning, the Department announced on December 27, 1961.

The filmstrip was produced recently with technical and financial support from the Fish and Wildlife Service's Bureau of Commercial Fisheries in efforts to influence young people to choose careers in oceanography and marine biology.

"Deep Frontier" explains the importance of oceanography--the study of the last great frontier of our planet--and imaginatively portrays developments that may take place in the future. With only about one thousand oceanographers in the United States, the need for scientists in this field is increasing rapidly.



Fig. 1 - For direct explorations of the deeps of the ocean we now have the bathyscaphe from which man can study the ocean directly, watch living creatures in their natural environment and collect unusual specimens.

"Oceanography offers a challenging call to those who would venture into the unknown, for, truly, the oceans are the unknown," the filmstrip comments.

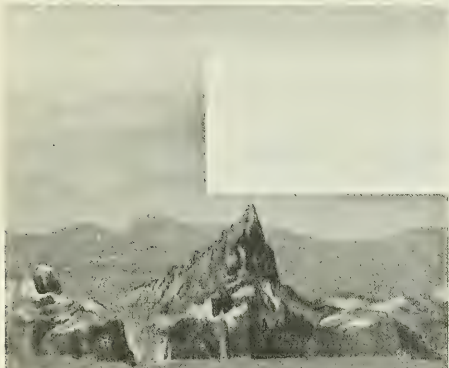


Fig. 2 - Only a few years ago soundings were made by dropping long weighted lines. Now soundings are made from ships by acoustic signals that echo off the bottom. The echo time-interval, and thus the depth, is recorded automatically on moving graph paper.

"Deep Frontier" is recorded either for synchronized projection or manual operations and runs 17 minutes. Interested teachers or schools should arrange with their State education departments' audio-visual instructors for free loan of the filmstrip. Colleges and universities should write to the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.



Oregon

FISH COMMISSION HAIR SEAL HUNTING CONTRACT TO BE RENEWED:

"The Oregon Fish Commission's seal control activities in the lower Columbia are apparently have been paying off," the State Fisheries Director stated early in January 1962. "Bounty payments to free-lance seal hunters are down from previous seasons," he said, citing the smaller numbers of bounty claims during the past two years as one indication of reduced seal numbers.

"Losses of salmon through the depredations of the common harbor or hair seal are believed to have assumed substantial proportions during some seasons. Fewer seals have been sighted in the river, and reports of losses to the marauding animals of salmon from the nets of commercial fishermen have been less common since a seal hunter was employed two years ago," the Fisheries Director added.

The occasion for the observations was the pending renewal of the seal hunting contract for the lower Columbia River area, let annually to cover the following 12 months. Under terms of the current agreement, the Commission's contract seal hunter must provide all equipment necessary for the job. Compensation is made for each day of actual hunting. During the past two years, a thoroughly qualified hunter of long experience has held the contract. Under terms of the contract, the hunter must be available for seal control work at all times. This fact makes it impractical for a seal hunter to combine fishing with seal control activities.

Funds for the contract control activities, as well as for bounty payments to free-lance seal hunters, are derived from special fees paid by both Columbia River gill-netters and packers. The money is earmarked specifically for Columbia River seal control. During the past seven years, an average of 69 seals has been submitted annually for bounty. The Commission pays a \$25 bounty for each seal carcass turned in to an authorized agent of the Fish Commission and certified as having been killed in the specified Columbia River area.



Oysters

LONG ISLAND SOUND SPAWNING AND SETTING OBSERVATIONS, SUMMER 1961:

Studies in the past summer of 1961 completed a quarter of a century of systematic observations on the spawning and setting of oysters in Long Island Sound by the Milford (Conn.) Biological Laboratory of the U. S. Bureau of Commercial Fisheries. These observations, which began in 1937, probably present the longest uninterrupted study of propagation of the American oyster, *Crassostrea virginica*, and of the ecological factors controlling it. Various aspects of the studies, contributing to the management of shellfisheries, have already been published.

The number and location of the stations (observation and sampling areas) established for these studies in the oyster-producing section of Long Island Sound varied from year to year depending upon the circumstances. In some years the chain of stations extended from the Thimble Islands to the Norwalk Islands, thus covering a distance of about 35 miles along the Connecticut shore. However, during the last 20 years the observations were principally concentrated at ten basic stations. These stations were established at different depths in the New Haven, Milford, and Bridgeport areas where most of the important oyster beds are located.

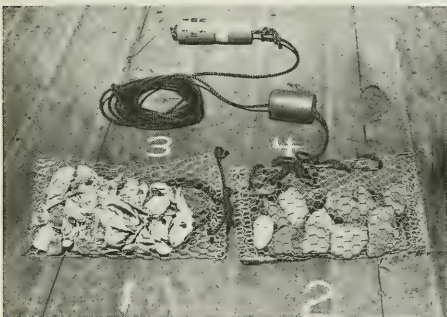


Fig. 1 - Oyster Set Collector Unit: (1) bag made of chicken mesh wire containing approximately 40 clean oyster shells. Newly set oysters are counted only on the inside clean surface of these shells; (2) chicken wire bag filled with rocks to serve as anchor; (3) tarred rope; (4) auxiliary float helps to maintain rope in vertical position; (5) surface float indicating position and number of collector. As a rule, two shell-filled bags (1) are placed at each station where observations on time and intensity are made.

Spat collectors, used to catch and record the set, were usually placed in the water long before setting of oysters was expected to begin. This was done because the same collectors were also used for observations on setting of starfish which, as a rule, begins 2 or 3 weeks prior to the beginning of oyster setting. The collectors were changed twice a week being always replaced by new, unused duplicates. Recovered bags were brought to the laboratory where the shells were examined and the number of set counted under low-power microscopes. The research boat Shang Wheeler was used in these studies, as well as in routine observations on the conditions in Long Island Sound, including examination of cultch (loose shells) planted by oystermen on commercial beds.



Fig. 2 - U. S. Bureau of Commercial fisheries research boat and floating laboratory Shang Wheeler used by Milford Laboratory biologists in their work in Long Island Sound and adjacent waters.

Prior to the beginning of setting the biologists studied the condition of the parent oysters and the degree of ripeness of their gonads. After the beginning of spawning, microscopic forms, present in sea water and called "plankton," were collected at several chosen stations. Oyster larvae, which are minute free-swimming organisms, constitute part of the plankton. The type and number of organisms of the plant and animal groups found in the samples helped the scientists to anticipate the biological events that were to follow. Routine observations on temperature and salinity changes of the water at the collecting stations were also made.

Plankton studies early in the 1961 season indicated that, as demonstrated by the presence of numerous young larvae in the water

samples, spawning of oysters began as usual. However, somewhat later, bivalve larvae at most of the stations became scarce or virtually entirely absent. This phenomenon coincided with a heavy bloom of dinoflagellates, a name given to microscopic forms which cause the so-called "red water." Several years ago, on the basis of laboratory experiments with "red water" organisms, we suggested that the products of their metabolism discharged in the surrounding water unfavorably affect oyster eggs and young larvae. We presume, therefore, that under natural conditions the external metabolites of dinoflagellates, represented last summer principally by *Prorocentrum micans*, certain species of *Gymnodinium*, and related forms, also affected the development of oyster eggs and larvae.

Dinoflagellates were present in extremely large numbers until approximately August 10. After that the water of Long Island Sound became considerably clearer but, because "red water" organisms had been prevalent during a large part of the oyster setting season, they had already caused damage.

The first set was recorded on July 21. At the basic stations setting was first observed on July 29, simultaneously at Stations 2, 4, 5, 6, and 7. This was a very light setting, indicating that only a few larvae managed to survive. During the next two weeks the intensity was even lighter, and during the week of August 12-18 setting was recorded only at Station 6.

Between August 19 and 25 setting of a more general nature was recorded in all three major areas of observation. The peak took place between August 26 and September 1, setting being recorded at all stations except Station 10. After this peak the intensity of setting sharply declined and after September 8 some stations caught no new set whatsoever. The last set of the season found at any of the stations, basic or auxiliary, was recorded on October 7 at Station No. 11.

On a percentage basis, approximately 8 percent of the season's total set took place during the week of July 29-August 4. Setting during the next week constituted about 2 percent of the season's total, and in the following week, only about 0.2 percent. The week of August 26-September 1, representing the peak of setting, accounted for approximately 54 percent of the total set. During the week

of September 2-8 it decreased to 14 percent and the following week, to approximately 2.5 percent. In general, over 80 percent of the season's total set was confined to a three-week period, beginning August 19 and ending September 8, 1961.

A comparison of the intensity of setting at the ten stations showed that Station No. 5, located on the State spawning bed in New Haven Harbor, occupied first place. Station No. 6, also located in New Haven Harbor and not too far from Station No. 5, ranked second, although considerably lower in intensity than Station No. 5. A disappointing feature of the season was that Station No. 10, which for years ranked as the most promising set-producing area, was one of the poorest. Considering the recent history of this station several oyster companies, early in the summer, planted large numbers of shells in its vicinity but, unfortunately, their efforts met with failure.

Considering the combined set of the ten stations as 100 percent, the season's set at Station No. 5 constituted 45.42 percent of the total. Station No. 6 produced 15.14 percent and Station No. 4, 8.53 percent. All these stations are located in New Haven Harbor. Station No. 10, however, received only 1.49 percent of the total set, thus being only slightly higher than the two lowest stations, 3 and 7.

We cannot offer a satisfactory explanation for the variations, or, in some instances, stability from year to year in the relative productivity of the stations in different areas. Many reasons and, of course, speculations can be advanced, most of them unfortunately, unverified. Nevertheless, there is little doubt that the intensity of setting at all stations depends, to a considerable extent, upon the in-shore system of minor water currents. These currents are usually well defined and are of a rather definite pattern but, nevertheless, in some instances, their directions may so change that the larvae will be carried away and metamorphose in other areas.

The second assumption, why setting at Station No. 10 was a failure, is that the oyster bed from which the larvae populating this station normally originated, was destroyed or that spawning there was a failure, and therefore, no larvae, or very few of them reached maturity and set at or near that station.

As already mentioned, the observations on time and intensity of oyster setting in Long Island Sound were carried on for 25 years. During this period settings poorer than in 1961 were recorded only on three occasions, i.e., 1943, 1954, and especially 1957, which was virtually a complete blank. The 1961 set, therefore, contributed very little to the oyster population of Long Island Sound and to the New England oyster industry in general.



Fig. 3 - Biologists of Milford Biological Laboratory counting seed oysters on culch dredged from oyster beds located in different parts of Long Island Sound. Simultaneously with counting of set, condition of young oysters is noted, as well as presence or absence of their enemies and competitors.

Considering that the oyster reserves prior to the setting of 1961 were extremely low and that the starfish set in the summer of 1961, although not too heavy, survived and grew extremely well, significantly adding to the already existing starfish population, the situation of the Connecticut oyster industry is critical and all possible measures should be taken to save it from total destruction. We strongly believe that the application of hatchery methods for the production of seed oysters, which have been developed and perfected largely at the Milford Laboratory, and use of chemical methods to control oyster enemies as soon as they are approved by the Food and Drug Administration, may be the decisive measures in helping to reverse this critical situation. These measures will help to recreate a new healthy aquatic industry guided by scientific principles and newly acquired knowledge. In other words, the progress of aquaculture should resemble that of agriculture and animal husbandry which is still advancing because of the proper application of scientific discoveries

made in the fields of genetics, pest control, and a better understanding of the physiological and ecological requirements of terrestrial plants and animals.

Note: For a more detailed report, write to Milford Biological Laboratory for a free copy of "Bulletin No. 9."

-V. L. Loosanoff,
Laboratory Director,
Biological Laboratory,
U. S. Bureau of Commercial Fisheries,
Milford, Conn.



Research Grants

FELLOWSHIP GRANTS TO BE AWARDED FOR FISHERIES RESEARCH:

Launching of a new program of fellowship grants in the field of fisheries and oceanographic research was announced on December 22, 1961, by the U. S. Department of the Interior. Invitations to participate in the program were sent early in January 1962 to qualified educational institutions. Approximately 15 two-year fellowships will be awarded in 1962 from appropriated funds totaling \$200,000.

With this program, the Department said, the Fish and Wildlife Service's Bureau of Commercial Fisheries "hopes to attract and assist the scientific manpower necessary to further its objectives for the Nation's welfare and thus aid the advancement of the overall aims of the National Oceanographic Program, particularly in the field of fishery research.

A panel of six representatives of universities and private research institutes met with Department officials to advise on rules, policies, and procedures for making the grants and the scope of research areas to be covered.



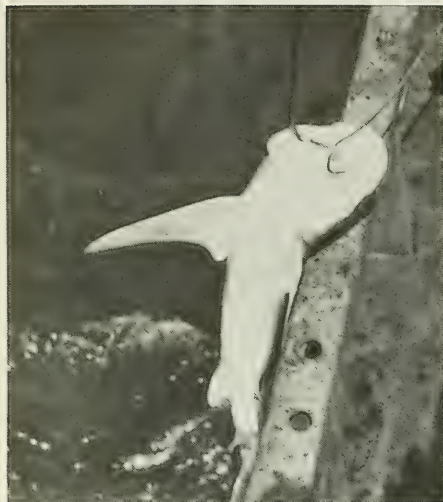
Sharks

INTERIOR DEPARTMENT REPORTS ON ATLANTIC SHARK AND GAME FISH STUDY:

A total of 311 sharks was taken in a recent two-months research project coordinated by the U. S. Fish and Wildlife Service in the Middle Atlantic Bight, the U. S. Department of the Interior reported on December 18, 1961. The study was undertaken to determine the abundance and food habits

of sharks in the area and to serve as a pilot survey extending from Long Island to Cape Henlopen, Del., and seaward to the edge of the Continental Shelf, of oceanic conditions affecting the distribution and abundance of marine game fishes.

Results showed there were more large sharks in the area than anticipated, suggesting that important relationships of sharks to environmental conditions and to sport fishing may exist.



Dusky shark being gaffed aboard a research vessel.

The 311 sharks taken represented 10 species, 7 of which have reputations of being dangerous to man—the great white shark, mako, tiger, sandbar, dusky, and two species of hammerhead. The largest specimen, a 12-foot tiger shark, weighed 1,100 pounds. The smallest shark weighed 1.5 pounds.

Several big game fish were taken: albacore, bluefin, and yellowfin tunas; dolphin, swordfish, and white marlin. The largest was a 247-pound yellowfin.

Examination of the shark stomachs indicated the sluggish species fed upon bottom-dwelling fish, but the swiftly swimming great white shark and the mako fed upon bluefish and other active fish. Garbage, such as fish heads, beef cuttings, and bacon and sausage, was eaten. Even aluminum foil was consumed. Chumming material used to entice sport fish to the vicinity of fishing boats was found, as well as waste which could only have come from ocean-going vessels or from garbage scows.

Eight 3- to 5-day cruises were made between August 13 and October 13. Three types of gear used were long lines, two to 10 miles in length; 1,500-foot gill nets; and 2,000-foot chain gear set for bottom fishing.

Shark catches declined when surface water temperatures went down in late September and early October. Continuous

surface temperature recording was maintained on all cruises and 300 surface-to-bottom temperature profiles were obtained. Over 1,000 surface-drift bottles and bottom-drift indicators were released, and 300 water samples were taken for laboratory examination for salinity and other chemical constituents.

The 1961 research was planned and coordinated by the Sandy Hook (New Jersey) Laboratory of the U. S. Bureau of Sport Fisheries and Wildlife. Agencies cooperating in the project included the U. S. Bureau of Commercial Fisheries; the Delaware Game and Fish Commission; Lamont Geological Observatory of Columbia University; New Jersey Conservation Department; the Aquarium of the New York Zoological Society; and the United States National Museum, Washington, D. C.

It was the first cooperative study of its kind and may serve as a basis for similar studies along the coasts, the Fish and Wildlife Service said.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS AS OF DECEMBER 31, 1961:

Item and Period	1961	1960	1959	1958	1957
(all heads-off)	..... (1,000 Lbs.)				
Total Landings, S. Atl. & Gulf States:					
December	6,600	7,097	8,716	8,099	6,718
November	9,800	14,454	12,412	12,416	9,302
January	5,688	4,800	4,310	5,254	6,220
January-December	92,045	141,035	130,659	116,552	116,238
Quantity used for Can-ning, Gulf States 1/:					
December	800	977	1,278	1,943	882
November	2,300	1,614	2,312	3,424	953
January	199	289	308	146	114
January-December	15,737	28,594	24,679	26,404	18,386
Frozen Inventories (as of end of each month) 2/:					
December	19,975	40,913	37,886	32,844	21,719
November	20,608	37,264	37,334	30,211	22,326
October	17,811	31,209	33,057	24,620	20,362
January	37,842	34,332	30,858	17,963	15,074
January-December, monthly avg.	23,186	25,954	27,297	18,008	13,627
Imports 3/:					
December	4/	12,411	10,611	10,447	6,865
November	14,852	13,516	10,269	10,617	6,789
October	16,813	14,211	15,340	11,463	9,237
January	12,338	8,596	8,238	5,696	5,679
January-November	110,840	101,007	95,944	74,946	62,812
January-December	4/	113,418	106,555	85,394	69,676

1/ Pounds of headless shrimp determined by multiplying the number of standard cases by 35.

2/ Raw headless only; excludes breaded, peeled and devilled, etc.

3/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/ Not available.

Note: Data for 1961 are preliminary. December 1961 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to head-on weight multiply by 1.68.



South Atlantic Exploratory Fishery Program

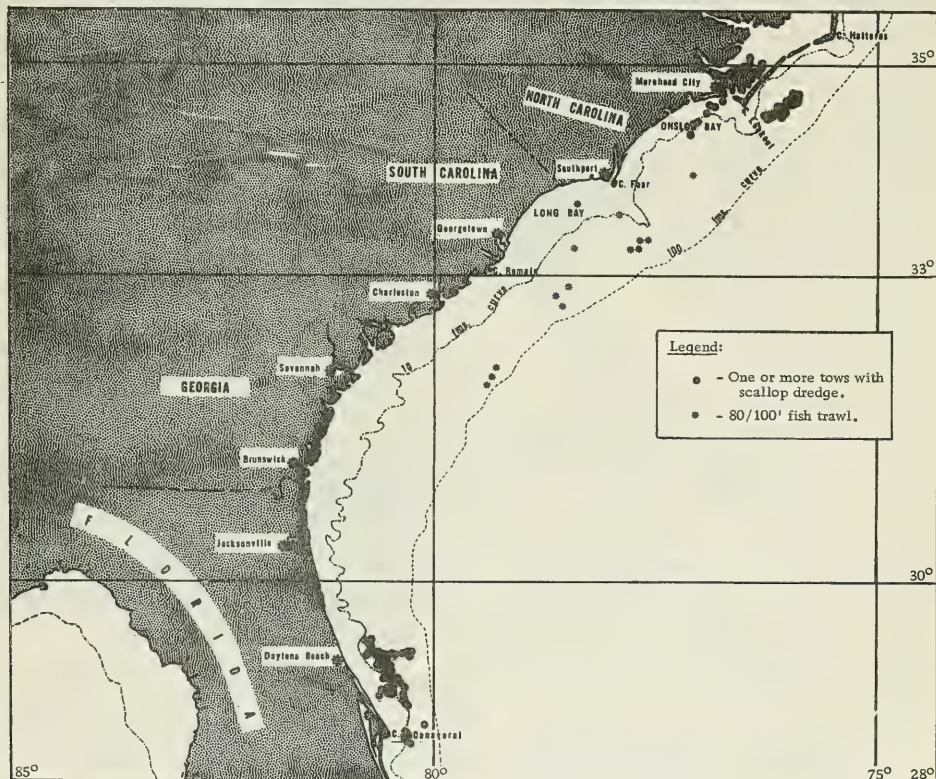
EXPLORATORY FISHING FOR CALICO SCALLOPS AND SNAPPERS:

M/V "Silver Bay" Cruise 35 (November 28-December 15, 1961): Exploratory fishing for calico scallops and snappers was the purpose of Cruise 35 by the M/V Silver Bay of the U. S. Bureau of Commercial Fisheries. The vessel returned to Brunswick, Ga., December 16, 1961, after the 18-day cruise between Cape Canaveral, Fla., and Cape Lookout, N. C.

The first portion of the cruise was devoted to additional calico scallop dredging

on the Cape Canaveral bed, with the majority of the fishing effort taking place in the northern section extending from Cape Canaveral to Daytona Beach. The second portion of the cruise was devoted to bottom trawling explorations between Cape Lookout and Savannah, and scallop explorations in an area near the Core Banks calico scalloped.

Off Daytona Beach catches of calico scallops ranged up to 30 bushels per 30-minute drag using an 8-foot tumbler dredge. In this general area, commercial catches were made consistently for 20 miles from west to east and for 30 miles from south to north in the 13- to 16-fathom depth range. The best catches were made in $14\frac{1}{2}$ fathoms where the scallops were predominantly large (50 to



M/V Silver Bay Cruise 35 (Nov. 28, 1961 to Dec. 15, 1961).

65 mm. in width) and in prime condition. Meats ranged from 80 to 120 count per pound. The largest catches were comprised of less than one percent of trash and sorting was therefore unnecessary.

Twenty-seven drags on the scallop bed off the Core Banks Bed previously defined by the M/V Silver Bay produced catches only as high as 0.8 bushel per 30-minute drag. Shell size was large (60 to 70 mm. in width) and the meats were fair to poor. There was no evidence of a high mortality (large amounts of dead shell) or replacement stock (small seed scallops).

Fourteen drags using an 80/100 roller-rigged fish trawl with funnel flappers were made between Cape Lookout and Savannah. One 1,477-pound catch at 33° 15' N., 77° 51' W., included 550 pounds of large (16"-18") vermillion snapper (*Rhomboplites aurorubens*). Other catches ran as high as 2,195 pounds of mixed fish per 90-minute drag and were usually composed of varying amounts of tomtate (*Bathystoma aurolineatum*), scup (*Stenotomus*), porgy (*Pagrus* and *Calamus*), grey triggerfish (*Balistes capriciscus*), and grouper (*Mycteroperca*). Small amounts of large croakers (*Micropogon undulatus*), porgy, grouper, and red snapper (*Lutjanus blackfordi*) were taken off Savannah in 35-50 fathoms.

Note: See *Commercial Fisheries Review*, Jan. 1962 p. 29.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, OCTOBER-DECEMBER 1961:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for October-December 1961:

Oyster Research: Research was continued on the use of solite as a substitute cultch for oyster cultivation. Thus far this material has not compared favorably with South Carolina steamed shell. Since this experiment began when spatfall was approaching the bottom of its annual curve, the study will have to be continued in the spring of 1962 when young oysters are again setting on cultch.

Studies on the spawning and setting season for oysters was completed in mid-October. These studies indicated a relatively heavy oyster set during the 1961 season.

A state-wide survey was conducted to determine the degree to which oysters are infested by the sporozoan parasite *Nematopsis ostrearium*. This pest of oysters is not harmful to man and, actually, seems of little consequence to oysters. From samples taken throughout the State, there seems to be little correlation between the relative abundance of this pest and water temperatures, salinities, or elevation of the oysters in relation to the low-water mark.

In connection with the mapping of oyster beds under lease in South Carolina being carried on as a joint program by Laboratory and the State's Division of Commercial Fisheries, the Laboratory has put special emphasis on locating and mapping subtidal oyster beds. These are extremely rare in South Carolina waters, but appear to have increased in extent in the past few years. This is coincident with an increase in annual rainfall. The resulting lowered salinities had served to hold and check infestation of oysters by boring sponges, one of the most serious pests of oysters in the State. However, a decided lack of rainfall in the past quarter has raised salinities, and the boring sponge is again very prevalent on subtidal beds.

Shrimp Research: Shrimp survey records are now complete through December of 1961. These records show that during October-December 1961, white shrimp were approximately 53 percent less abundant at experimental stations as in that period in 1960. Both white and brown shrimp were very scarce throughout 1961 as compared with 1960, as white shrimp decreased by over 50 percent and brown shrimp declined in abundance by more than 70 percent at shrimp survey stations. The average catch per unit of effort for both species of shrimp in experimental trawling was 59 percent less in 1961 than in 1960.

The scarcity of shrimp in 1961 has also been evident in the commercial catch of South Carolina, which was more than 50 percent below that of 1960 as of November 1. A similar situation exists all along the South Atlantic and Gulf Coasts, and it is most likely that the decrease in abundance of commercial shrimp this year is due to natural conditions. Quite possibly some natural occurrence, such as excessive mortality of the brood stock of shrimp left over from 1960, prevented successful spawning this year. It is known that postlarval shrimp were very scarce in inshore

waters this year, since minimal numbers were taken in plankton tows at experimental stations.

Five new experimental stations were added to the shrimp survey program during the quarter. These stations extend northward from the Laboratory and beyond Charleston. Establishment of these stations expands the area formerly covered by the Laboratory's shrimp survey, and it is felt that experimental work at those locations will provide valuable additional information on the biology of marine life in South Carolina.

Fish: In this quarter the experimental trawl hauls made at the regular established stations in South Carolina showed that the average catch per unit of effort of whiting and croaker was almost identical with that of the same quarter in 1960. Spot, on the other hand, showed a decline of over 50 percent.

Crabs: Of the blue crabs taken in experimental trawls, the young and immature crabs showed no change during the time of this report, but mature crabs were about 30 percent less abundant as compared with 1960.

Note: See Commercial Fisheries Review, Sept. 1961 p. 45.



Tagging

BRIGHT COLORS AID TAG RECOVERY:

A total of 1,000 7-inch herring were tagged in Eastern Penobscot Bay, Maine, during October. In addition to the fish tagged with the bright yellow tag, equal numbers of



fish tagged with dark green and scarlet tags were released to determine if color had any effect upon tag recovery. To date yellow has proved five times more effective than green. No scarlet tags have been recovered.

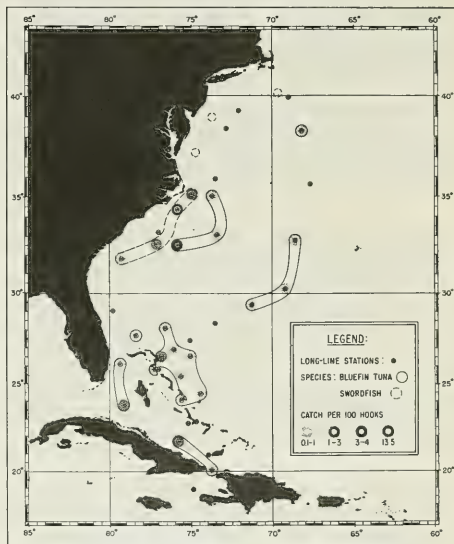


Tuna

MIGRATIONS IN NORTH ATLANTIC STUDIED BY R/V "CRAWFORD":

A significant number of tuna were caught in the North Atlantic in April-May 1961 by the research vessel Crawford of the Woods Hole Oceanographic Institution. Important new information on the distribution and spawning of large pelagic fishes was provided by this cruise of the research vessel.

Long lines were used to fish the area from Cape Cod to Jamaica and back between April 19 and June 8, 1961. A total of 38 sets (15,730 hooks) were made, mostly in areas which had not been explored in this manner at that time of year.



Cruise 62 of R/V Crawford, April 19-June 8, 1961, showing location of long-line stations and catches of bluefin tuna and broadbill swordfish only.

The take numbered 60 bluefin tuna, 33 yellowfin tuna, 13 albacore tuna, 3 blackfin tuna, 2 skipjack tuna, 13 broadbill swordfish, 12 blue marlin, 39 white marlin, 6 sailfish, 11 wahoo, 151 dolphin, 57 miscellaneous fish, and 174 sharks.

The most significant results concerned the bluefin tuna (*Thunnus thynnus*) and the

swordfish (*Xiphus gladius*). Catches of giant bluefin nailed down a migratory route of the fish into the Bimini-Cat Cay area where they appear regularly late each spring; evidence was also obtained of a similar run along the eastern or Atlantic side of the Bahamas Islands. Swordfish were taken in an area where their presence had not been suspected--in the Gulf Stream between Charleston, S. C., and Cape Hatteras.

The route by which the giant tuna reach the Bimini-Cat Cay area has long been a subject of speculation. In recent years vessels of the U. S. Fish and Wildlife Service have found concentrations of bluefin in the Windward Passage in late April and in the Gulf of Mexico through the late winter and early spring. In the Crawford cruise strong evidence was found of a migration route from the Windward Passage through the Old Bahama and Santaren Channels to Cat Cay. In fact, the Crawford made a very heavy catch in Santaren Channel on May 22; two days later and 100 miles to the north the Cat Cay Tuna Tournament enjoyed a record catch of 44 fish after several days of very poor fishing.

Rumors of a run of giant tuna along the outside of the Bahamas have been persistent but unsubstantiated. The Crawford caught them in 9 out of 10 sets between San Salvador and the northern end of the group, some close to shore and others up to 100 miles out, confirming their presence in considerable number over a vast area. Negative results in the Crooked Island Passage and west of Great Inagua Island indicated that the runs on the respective sides of the Bahamas are separate.

Detailed long-line studies of both groups, which could be carried out from a smaller vessel working out of a southern port, might clarify the duration, geographical extent, and volume of the migrations.

Some idea of the tuna route north from the Bahamas was obtained in 12 sets made up the coast as far as Hudson Canyon--they were taken only in sets east of the Gulf Stream, not in the stream or west of it. Another group of giant bluefin further out in the Atlantic was suggested by catches at each of three stations west and southwest of Bermuda.

The swordfish catches were an important and unexpected new development. They were

taken at four stations, the most remarkable being a catch of 8 swordfish and 3 yellowfin tuna on an overnight set of only 60 hooks. The concentrations of swordfish provide new distributional data on this important species and point up the exciting possibility of tracing its migration in more detail by long-line fishing from Cuba northward.

A total of 27 tuna and 22 marlin and sailfish were tagged for the study of migration and population. Bathythermograms, hydrographic stations, transparency measurements, dip-netting, and plankton tows were made in conjunction with all the long-line sets. The stomach contents of the catches were examined to study feeding habits and search for juveniles of the large fish. A wealth of material was gathered for laboratory study and many larvae were hatched and preserved along with matching egg samples.

The gonads of the captured fish were examined to determine their condition relative to spawning. Ovaries of bluefin taken east of the Bahamas contained more eggs than any previously examined and were the largest yet encountered, some pairs weighing up to 25 pounds. A fully ripe female white marlin was caught off Walter Cay, adding to our knowledge of the spawning habits of this species. Measurements of body proportions and fins and counts of fin rays and gill rakers were also made.

The cruise was supported by funds from the National Science Foundation and the U. S. Hydrographic Office. The U. S. Bureau of Commercial Fisheries in Gloucester, Mass., furnished long-line gear. Scientists from the Fish and Wildlife Service and Harvard University, the Bingham Oceanographic Institution at Yale, and the American Museum of Natural History took part in the cruise.

It was the second important long-line cruise for the Crawford, a 125-foot converted Coast Guard cutter. In November 1960 the vessel cruised off the continental shelf along the New England coast and pinpointed the whereabouts of the bluefin tuna at that time of year.

Note: Also see p. 1 of this issue.

* * * * *

TAGGED BLUEFIN SWIMS ACROSS NORTH ATLANTIC OCEAN:

A giant bluefin tuna that swam across the North Atlantic Ocean from the Bahamas to

Norway in less than four months was reported by the Woods Hole Oceanographic Institution on November 1, 1961. The fish was tagged off Cat Cay in the Bahamas on June 10, 1961, according to the scientist in charge of the Institution's tagging program. The tag was recovered near Bergen, Norway, on October 6, 1961.

The distance between the two points is more than 4,500 nautical miles. The time between tagging and recovery was 118 days. That means an average speed of at least 33 miles per day, assuming the fish started the day it was tagged, swam steadily in a bee-line for Norway, and was caught the day it got there. The cruising speed of the giant bluefin is thought to be about three knots. This fish may have had some help from the Gulf Stream during part of the trip.

The tag was the first transatlantic recovery from a giant bluefin since the scientist in charge of the Institution's tagging program began the program in 1954. Two much smaller bluefin tagged off Martha's Vineyard, Mass., in July 1954, were recovered by French fishermen in the Bay of Biscay about five years later. In those cases, however, the time lag was too great for any meaningful observations except the fact that they made the ocean crossing.

The scientist noted that the latest recovery was interesting not only because of the short time and long distance involved but because the long migrations of tuna are usually thought to occur in the spring and fall rather than the summer.

The long-distance swimmer was tagged by two sport fishermen participating in the tagging program: the owner, from Wilmington, Del., and the skipper, from Ft. Lauderdale, Fla., of the sportfishing boat *Caliban II*. Between them they have tagged nearly 100 giant tuna. The one they tagged on June 10 weighed about 350 pounds.

The recovery of the tag was reported by a scientist of the Norwegian Institute of Marine Research in Bergen. He said the tag came from a catch of 192 bluefin brought in by a commercial seiner. It was only by a stroke of great luck that the tag was noticed at all, for it was found lying on the dock after the catch had been unloaded. The tag is a bright yellow streamer attached to the fish with a small barb. Each tag is numbered and bears a legend, in several languages, offering a reward for its return.

The Woods Hole Institution's tagging program is aimed at learning more about the migratory habits and growth patterns of the tuna and other large fish such as marlin and sailfish. So far more than 4,500 fish have been tagged, by scientists and cooperative sportsmen: 30 tags have been recovered. The program is supported by the National Science Foundation and the Charles W. Brown Jr. Memorial Foundation.



U. S. Foreign Trade

"E" AWARDS FOR EXPORT EXPANSION:

Secretary of Commerce Luther H. Hodges on December 19, 1961, called on American industry to engage in friendly competition for President Kennedy's new "E" awards for export expansion. The Secretary said he hoped to be able to announce the winner of the first "E" early in 1962, adding that several hundred inquiries were received from companies, financial institutions, and trade associations following the President's announcement of the new program on December 5.

"American industry has a vital role to play," Secretary Hodges said. "Through the expansion of exports, it can make substantial contributions to the raising of living standards throughout the world, to the creation of jobs and profits here at home, to the maintenance of a more favorable balance of payment situation which, in turn, will help our country to continue to meet its commitments."

"It is for such contributions as these that the President's 'E' will be awarded. It is our hope that the future of the 'E' symbol in peacetime will be as glorious as was her past in wartime."

Expressing the hope that the first "E" winner could be selected from a field of at least 10,000 nominees, Secretary Hodges outlined ground-rules for administration of the program.

The former Army-Navy "E" for wartime production efficiency has been revived for excellence in export expansion and will be administered by the Commerce Department, in cooperation with a number of other government agencies. Nominations for awards may be submitted by any individual or company to the Commerce Department or any of its 34 field offices.

Nomination forms will be available at all Commerce Department offices, and through the Departments of Interior, Agriculture, and the Small Business Administration.

Completed nominations will be referred to appropriate Commerce field offices, and reviewed by the Department's Regional Export Expansion Committees. These are groups of volunteer international businessmen located throughout the United States.

Local committees will recommend approval or rejection of nominations to an Awards Committee composed of representatives of Commerce, Interior, and Agriculture departments, Small Business Administration, and other government agencies which will be consulted in areas of their specialized competence.

"E" flag awards will be conferred upon companies which: (1) Demonstrate a substantial increase in export sales on a sustained basis; (2) Successfully introduce a new product into the United States export trade; (3) Develop a market abroad for an existing product not previously exported; (4) Effect a breakthrough in a foreign market where competitive conditions are extremely

difficult; (5) Open a new trade area previously closed to American competition.

The "E" Certificate of Service will be awarded to such non-exporting individuals and organizations as banks and trade associations for novel and successful solutions to foreign trade problems, and contributions to the expansion of exports through superior marketing, promotion and other efforts.

Winners of the flag awards will be authorized to fly the blue and white banner over their plants and offices, to display the accompanying certificate of commendation, to issue "E" lapel pins to employees, and to refer to the award in advertising.

"E" certificate winners will also be authorized to issue lapel pins and to mention the award in their advertising.

* * * * *

EDIBLE FISHERY PRODUCTS, NOVEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during November 1961 rose 7.9 percent in quantity and 6.0 percent in value as compared with October 1961. The increase was due primarily to greater imports of frozen fillets other than groundfish, frozen albacore tuna, canned tuna in brine, fresh and frozen salmon from Canada, and canned sardines in oil and not in oil.

Compared with the same month in 1960, the imports in November 1961 were up 14.9 percent in quantity and up 28.0 percent in value. The increase in value was due to the higher prices for nearly all imported fishery products. The general increase came about because of more imports of all types of frozen fillets, shrimp, oysters, scallops, fresh and frozen salmon, canned tuna, and canned sardines. These increases were offset somewhat by declines in the imports of frozen tuna and canned salmon. The increase in canned sardines was due to the light supplies in the United States because of substantial drops in the packs of Maine and California sardines in 1961.

U. S. Imports and Exports of Edible Fishery Products, November 1961 with Comparisons						
Item	Quantity			Value		
	Nov.	Year		Nov.	Year	
	1961	1960	1960	1961	1960	1960
..(Millions of Lbs.).. ..(Millions of \$)..						
Imports:						
Fish & Shellfish: Fresh, frozen & processed/1	100.9	87.8	1,011.2	33.8	26.4	304.8
Exports:						
Fish & Shellfish: Processed only/1 (excluding fresh & frozen)	3.9	5.0	48.7	1.9	2.3	19.2
1/Includes pastes, sauces, clam chowder and juice, and other specialties.						

United States exports of processed fish and shellfish in November 1961 were up 50.6 percent in quantity and 58.3 percent in value as compared with October 1961. Compared with the same month in 1960, the exports in November 1961 were down 21.9 percent in quantity and 17.4 percent in value. The lower exports in the first 11 months of 1961 as compared with the same period in 1960 were due to substantial declines in the exports of canned shrimp, salmon, California sardines, squid, and frozen salmon. United States supplies of all those products towards the end of 1961 were light. The only significant increases were in the exports of canned mackerel and frozen shrimp to Japan. But frozen shrimp exports tapered off sharply after July because United States landings were down sharply.

* * * * *

EDIBLE FISHERY PRODUCTS, OCTOBER 1961:

Imports of edible fresh, frozen and processed fish and shellfish into the United States during October 1961 rose 12.8 percent in quantity and 21.3 percent in value as compared with September 1961. The increase was due primarily to greater imports of frozen fillets other than groundfish, frozen albacore tuna, canned tuna in brine, fresh and frozen salmon from Canada, canned sardines in oil and not in oil, frozen spiny lobster tails, frozen shrimp, and oysters. The increase in value was greater than the increase in quantity because prices were higher and the increase in imports was in the higher-priced products.

Compared with the same month in 1960, the imports in October 1961 were down 4.0 percent in quantity but up 8.1 percent in value. The increase in value was due to the higher prices in 1961 for nearly all imported fishery products. The drop in quantity came about because of smaller imports of frozen tuna, fresh and frozen salmon, canned salmon, and canned oysters. The substantial declines in the products mentioned were not offset by increases in the imports of frozen groundfish and other fillets, canned tuna, canned sardines in oil and not in oil, canned crab meat, shrimp, and Canadian scallops.

United States exports of processed fish and shellfish in October 1961 were up 100 percent in quantity and 71.4 percent in value as compared with September 1961. Compared with the same month in 1960, the exports in

U. S. Imports of Edible Fishery Products, October 1961 with Comparisons						
Item	Quantity			Value		
	Oct.	Year		Oct.	Year	
	1961	1960	1960	1961	1960	1960
	..(Millions of Lbs.)..			..(Millions of \$)..		
Imports:						
Fish & Shellfish:						
Fresh, frozen &						
processed ^{1/} . . .	93.6	97.4	1,011.2	31.9	29.5	304.8
Exports:						
Fish and Shellfish:						
Processed only ^{1/}						
(excluding fresh						
& frozen) . . .	2.6	6.1	48.7	1.2	2.8	19.2
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.						

October 1961 were down 57.4 percent in quantity and 57.1 percent in value. The drop in October 1961 exports as compared with the same month in 1960 was due primarily to lower exports of canned salmon, frozen salmon, canned California sardines, and canned shrimp.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1961 at the 12½-percent rate of duty was 57,114,714 pounds (about 2,720,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports from January 1-December 2, 1961, amounted to 52,024,510 pounds (about 2,477,000 std. cases), according to data compiled by the Bureau of Customs. Imports for the period were up 11.7 percent as compared with the same period in 1960.

Imports in 1960 for the period January 1-December 3 amounted to 46,563,451 pounds (about 2,217,000 std. cases).

Imports from January 1-December 30, 1961, amounted to 56,252,179 pounds (about 2,678,700 std. cases), according to data compiled by the Bureau of Customs. This was only 862,535 pounds (41,300 cases) less than the quota. Imports for the period were up 11.9 percent as compared with the same period in 1960. However, final data for 1961 may be slightly higher.

Final imports in 1960 amounted to 51,159,003 pounds (about 2,436,100 std.

cases)--2,289,327 pounds (about 109,100 std. cases) less than the quota of 53,448,330 pounds (2,545,200 std. cases). In 1959 the quota of 52,372,574 pounds (2,493,900 std. cases) was reached early in December and final imports for that year of 55,304,542 pounds (2,633,500 cases) exceeded the quota by 2,932,000 pounds or 139,600 cases (this amount was imported at the 25-percent ad valorem rate of duty).

Note: Pounds converted to cases at 21 pounds equal 1 std. case of 48 7-oz. cans.

UNITED STATES EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN, JANUARY-SEPTEMBER 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably in September 1961. Of the almost 7.4 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 8 months of 1961, 4.9 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp ^{1/} to Japan, January-September 1961				
Type of Product	July	August	Sept.	Jan.-Sept.
Domestic	1,211	243	17	1,917
Foreign	1,137	254	40	2,999
Total	2,348	497	57	4,916
^{1/} Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.				

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of that year and a strong market, that country purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

Note: See Commercial Fisheries Review, Jan. 1962 p. 36, Dec. 1961 p. 52, Nov. 1961 p. 35.



Vessel Mortgage Insurance Program

APPLICATIONS RECEIVED AND APPROVED IN 1961:

During calendar year 1961 a total of 9 applications for mortgage insurance were received by the U. S. Department of the Interior under its program for insuring mortgages on fishing vessels. The mortgages covered by the applications totaled \$1,277,500. The program was started in January 1961 when the application of an Alaska salmon cannery was approved for insuring a mortgage of \$75,000 on 10 gill-net vessels built to replace fish traps which have been abolished in Alaska.

Of the 9 applications received in 1961, 5 applications for mortgages totaling \$251,500 were approved by the end of the year. One application for a mortgage of \$534,750 was declined. As of the end of the year, 4 mortgage insurance contracts were outstanding covering mortgages amounting to \$229,500. At the end of the year there were 3 applications pending for mortgage insurance on mortgages amounting to \$491,250.

Under the mortgage insurance program the U. S. Department of the Interior guarantees the lender or mortgage holder the insured amount of the mortgage. Should the borrower fail to pay, the Department pays but has legal recourse to the borrower's assets.

Administered by the Bureau of Commercial Fisheries, authorization for the mortgage and loan insurance program was given the Department in March 1958, when the fishing vessel mortgage program was transferred from the Maritime Administration. In July 1960 the Congress approved a method of financing the program should financing be necessary.

Persons obtaining mortgage insurance pay the Department one percent per year on the average unpaid balance of the loan. The money is deposited in a revolving fund which is available to pay claims.

Note: See Commercial Fisheries Review, April 1961 p. 38.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, NOVEMBER 1961:

During November 1961, a total of 19 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 27 in November 1960. The number issued first documents the first 10 months of 1961 was 7 less than in the same period of 1960.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, November 1961 with Comparisons					
Area (Home Port)	Nov.		Jan.-Nov.		Total
	1961	1960	1961	1960	1960
Issued first documents 2/:	..... (Numbers)				
New England	4	2	32	33	35
Middle Atlantic	-	1	11	18	18
Chesapeake	7	8	68	76	78
South Atlantic	1	2	40	46	47
Gulf	6	5	97	85	90
Pacific	1	5	147	141	146
Great Lakes	-	4	12	17	18
Puerto Rico	-	-	2	-	-
Total	19	27	409	416	432
Removed from documentation 3/:					
New England	2	1	18	22	22
Middle Atlantic	7	4	29	15	18
Chesapeake	1	3	27	18	21
South Atlantic	3	5	27	36	38
Gulf	12	8	96	84	90
Pacific	19	15	104	80	87
Great Lakes	1	4	17	12	13
Puerto Rico	-	-	-	1	1
Total	45	40	318	268	290

Note: For footnotes see October 1961 table 2, p. 47.

Note: For footnotes see October 1961 table 2, p. 47.

Table 2 - U. S. Fishing Vessels 1/--Documents Issued and Cancelled, by Tonnage Groups, November 1961		
Gross Tonnage	Issued 2/	Cancelled 3/
	..... (Number)	
5-9	8	9
10-19	6	17
20-29	2	3
30-39	-	3
40-49	-	4
50-59	-	3
60-69	1	1
70-79	2	1
80-89	-	1
90-99	-	1
100-109	-	1
140-149	-	1
250-259	-	1
Total	19	45

DOCUMENTATIONS ISSUED AND CANCELLED, OCTOBER 1961:

During October 1961, 28 vessels of 5 net tons and over were issued first documents

Table 1 - U. S. Fishing Vessels ^{1/}--Documents Issued and Cancelled, by Areas, October 1961 With Comparisons

Area (Home Port)	Oct.		Jan.-Oct.		Total
	1961	1960	1961	1960		1960
..... (Number).....					
Issued first documents ^{2/}					
New England	1	4	28	31	35
Middle Atlantic	-	2	11	17	18
Chesapeake	14	10	61	68	78
South Atlantic	2	1	39	44	47
Gulf	4	9	91	80	90
Pacific	6	7	146	136	146
Great Lakes	1	-	12	13	18
Puerto Rico	-	-	2	-	-
Total	28	33	390	389	432
Removed from documentation ^{3/}					
New England	1	2	16	21	22
Middle Atlantic	1	4	22	11	18
Chesapeake	-	-	26	15	21
South Atlantic	4	5	24	31	38
Gulf	7	4	84	76	90
Pacific	15	7	85	65	87
Great Lakes	-	-	16	8	13
Puerto Rico	-	-	-	1	1
Total	28	22	273	228	290
^{1/} For footnotes see table 2.					

^{1/}For footnotes see table 2.

as fishing craft, as compared with 33 in October 1960. The number issued first documents the first 10 months this year was only 1 more than in the same period last year.

Table 2 - U. S. Fishing Vessels ^{1/}--Documents Issued and Cancelled, by Tonnage Groups, October 1961

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
..... (Number).....		
5-9	12	3
10-19	10	14
20-29	2	3
30-39	1	1
40-49	1	-
50-59	1	1
60-69	1	-
70-79	-	1
80-89	-	2
160-169	-	1
300-309	-	1
960-969	-	1
Total	28	28

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

^{2/}Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 29 in 1961, 2 in 1960, 1 in 1959, 1 in 1957, and 7 prior to 1951. Assigned to areas on the basis of their home ports.

^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels to the United States, Bureau of Customs, U. S. Treasury Department.



Water Pollution

CONFERENCE TO EXAMINE PROBLEM OF WATER POLLUTION IN PUGET SOUND, UPPER COLUMBIA RIVER, AND IN MICHIGAN:

The U. S. Department of Health, Education, and Welfare on December 20, 1961, agreed to join with the States of Washington and Michigan in two separate interstate water pollution enforcement actions, applying to United States waters and sources of pollution only.

The waters involved in Washington are Puget Sound, the Strait of Juan de Fuca, and the Upper Columbia River and navigable tributaries within the boundaries of the State. The Michigan waters are the Detroit River and its outflow into Lake Erie.

The two actions are the first to be taken under new provisions of the Federal Water Pollution Control Act, which permit the Secretary to invoke Federal enforcement procedures in intrastate waters when invited to do so by a State Governor. First step in the procedure is a conference, which is then followed where necessary by formal hearings and finally, if still necessary, by action in the Federal courts.

The conference in the Washington State case was to be held in Olympia, Wash., on January 16, 1962. As of mid-December 1961 the Michigan State conference had not been scheduled.

A message was sent by the Department to the Governor of Washington. The message follows:

"I am sending you today official notification that the Department of Health, Education, and Welfare will join the State of Washington on January 16, 1962, in a conference to examine the problem of water pollution in Puget Sound and the Upper Columbia River within the State of Washington and their associated waters. This conference will be the first under the provisions of the Federal Water Pollution Control Amendments of 1961, which permit the Federal Government at the invitation of an individual State to take part in an action involving intrastate pollution.

"You and the State Water Pollution Control Agency have shown great leadership in bringing the State and the Federal Govern-

ments together in this action. Inevitably it will affect the welfare and prosperity of the State of Washington for many years to come and will be a most important factor in preserving the great water resources of the entire Northwest."

A message was also sent by the Department to the Governor of Michigan. The message follows:

"This is in response to your letter of December 6, 1961, requesting action under Section 8 of the Federal Water Pollution Control Act to assist the State of Michigan in correcting sources of pollution coming into the Detroit River and subsequently into Lake Erie.

"We shall be most happy to comply with your request. Our technical staff will be in touch with State representatives to determine with particularity the scope of the problems and investigations required.

"I am sure that a cooperative State-Federal approach will be material value in meeting these water pollution control problems of the State of Michigan."



Wholesale Prices, December 1961

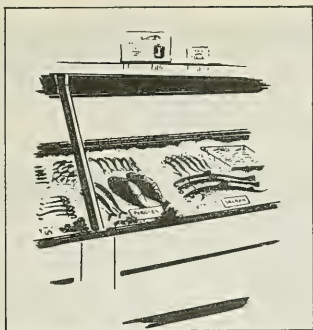
Light supplies of some of the major fishery products were responsible for the increase in wholesale prices from November to December 1961 and from December 1960. Wholesale prices for edible fish and shellfish in December 1961 were up 1.8 percent from the previous month and up 7.8 percent from the same month a year earlier, according to the wholesale price index for edible fishery products (fresh, frozen, canned). There was a steady increase in prices from April through December 1961 except for a slight dip in September.

From November to December 1961, the subgroup index for drawn, dressed, or whole finfish showed the greatest change among the four subgroups included in the index—an increase of 7.1 percent. Light landings of haddock at Boston caused the price of the drawn fresh product to go up 44 percent. Short supplies of yellow pike at New York City raised the prices for that product 33.7 percent. The only

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Dec. 1961	Nov. 1961	Dec. 1961	Nov. 1961	Oct. 1961	Dec. 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					143.6	141.1	138.1	133.2
Fresh & Frozen Fishery Products:					158.9	154.6	153.0	150.0
Drawn, Dressed, or Whole Finfish:					163.8	153.0	152.5	173.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.10	141.8	98.5	107.2	178.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.36	.35	109.8	108.3	107.3	92.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.85	193.8	191.0	191.0	202.2
Whitefish, L, Superior, drawn, fresh	Chicago	lb.	.63	.83	156.2	204.6	171.1	185.9
Yellow pike, L, Michigan & Huron, rnd., fresh	New York	lb.	.64	.48	148.9	111.4	105.5	117.3
Processed, Fresh (Fish & Shellfish):					161.5	158.8	158.6	146.8
Fillers, haddock, sml., skins on, 20-lb. tins.	Boston	lb.	.32	.34	107.2	115.7	108.9	175.2
Shrimp, lge. (26-30 count) headless, fresh	New York	lb.	.92	.88	144.6	138.3	136.7	114.5
Oysters, shucked, standards	Norfolk	gal	7.88	7.88	194.9	194.9	198.0	185.6
Processed, Frozen (Fish & Shellfish):					133.7	133.9	130.5	115.0
Filets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.35	103.6	109.9	103.6	106.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.30	124.9	120.8	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pk.	Chicago	lb.	.92	.90	141.2	138.1	135.8	106.5
Canned Fishery Products:					121.9	121.8	117.1	109.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt, meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	87.6	87.6	84.0	79.3
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.00	4.90	116.7	114.4	114.4	89.8
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	12.31	131.0	131.0	109.7	90.5

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



offsetting decrease occurred in fresh whitefish prices at Chicago which dropped 23.7 percent. Prices for frozen Western halibut at New York City rose 1.4 percent and for frozen king salmon at New York City rose 1.5 percent, in both instances because of good demand. On the other hand prices for this subgroup in December 1961 were down 5.6 percent from the same month in 1960. There were substantial price declines for fresh large haddock at Boston (down 20.3 percent), fresh whitefish at Chicago (down 16.0 percent), and frozen king salmon at New York City (down 4.2 percent). These declines were not quite offset by price increases of 18.3 percent for frozen Western halibut at New York City and 26.9 percent for frozen yellow pike at New York City.

Among the fresh processed products, prices rose 1.7 percent from November to December. Shrimp prices

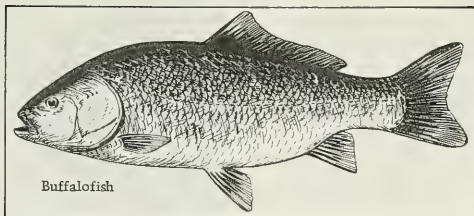
were up 4.6 percent with supplies still below demand. Fresh shucked oyster prices remained steady. But fresh haddock fillet prices dropped 7.4 percent. From December 1960 to December 1961, the prices for fresh processed fish and shellfish were up 10 percent principally because shrimp prices rose 26.3 percent and shucked oyster prices rose 5.0 percent. A drop of 38.8 percent in fresh haddock fillet prices at Boston prevented the subgroup index from showing a more substantial gain.

As a subgroup, there was practically no change in the index for frozen processed fish and shellfish from November to December 1961. But among the individual products, there were significant changes. While prices of frozen shrimp at Chicago and for frozen ocean perch fillets at Boston rose because of lighter supplies, heavier stocks of frozen haddock fillets caused a price drop for that product of 5.7 percent. However, prices for the subgroup in December 1961 were up 16.3 percent for a year earlier principally because of a 32.6 percent rise in the prices of frozen shrimp at Chicago and to a lesser extent because of an increase of 5.1 percent in frozen ocean perch fillet prices at Boston. Offsetting these increases were slightly lower prices for frozen flounder fillets and haddock fillets at Boston because of more plentiful supplies.

Among the canned fishery products, there was very little change from November to December 1961. There was a very small increase of 2.0 percent in canned California sardine prices because the pack through December was substantially less than in 1960. But canned fishery products prices from December 1960 to December 1961 were up 11 percent because of smaller packs of California sardines and Maine sardines. On the other hand, although the packs of canned tuna and canned salmon in 1961 were greater than in 1960, the demand for those products has more than kept pace with the increased supplies. Canned fish prices were up for all items included—canned pink salmon (up 1.8 percent), canned tuna (up 10.5 percent), California sardines (up 30.0 percent), and Maine sardines (up 44.8 percent).



FISH BIOGRAPHIES



Buffalofish

OTHER NAMES INCLUDE: Winter carp.

CHARACTERISTICS: Lean, firm and flaky, rich flavor.

MARKET SIZE: About 5 to 15 pounds.

MARKET FORM: Whole, drawn, dressed, steaked, filleted, and smoked.



International

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

SIXTH ANNUAL MEETING:

The Sixth Annual Meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) convened in Moscow on February 26, 1962, to adopt regulations and set a salmon catch quota for Japan for the 1962 fishing season.

The Science and Technology Committee of the Commission met in Moscow prior to the main meeting. The purpose of holding the preliminary talks is to shorten the period of negotiations by the Commission. Four main topics were discussed: (1) methods used in estimating the condition of the salmon resources; (2) expected salmon runs in 1962; (3) exchange of scientists and experts for joint surveys in 1962; and (4) success of the joint surveys in 1961.

* * * * *

RUSSIAN AND JAPANESE PACIFIC SALMON CATCH, 1961:

The Japanese Fisheries Agency released on December 19, 1961, the Russian and Japanese 1961 Pacific salmon catch data, which were exchanged between the two countries at

Table 1 - Russian Catch of Pacific Salmon by Area and by Species, 1961

Area	Species of Salmon					
	Red	Chum	Pink	Silver	King	Total
	.....(Centners 1/.).....					
East Kamchatka..	10,203	43,975	136,580	23,494	5,842	220,094
West Kamchatka..	87,731	29,431	44,322	21,078	699	163,261
Sakhalin-Kurile Islands	-	14,452	71,840	-	-	86,292
Northern Okhotsk..	-	19,847	34,514	301	-	54,662
Okhotsk Region ..	405	130,539	7,184	323	-	138,451
Amur	-	126,281	2,274	-	-	128,555
Maritime Province	-	-	6,061	-	-	6,061
Total	78,339	964,525	302,775	45,196	6,541	797,376

1/One centner equals 100 kilograms or about 220 pounds.

the meeting of the Science and Technology Committee of the International Northwest Pacific Fisheries Commission now in progress in Moscow. The Soviet catch totaled 79,738 metric tons and the Japanese catch, 145,664 tons.



Pulling in a gill net aboard a Japanese vessel in the North Pacific and removing the salmon from the net.

Press reports concerning the progress of the Technical Committee meeting indicate that Japan and the Soviet Union have reached agreement over the method of evaluating resources but have not been able to agree on the

International (Contd.):

Table 2 - Japanese Catch of Pacific Salmon by Fishery and by Species, 1961						
Fishery	Species of Salmon					
	Red	Chum	Pink	Silver	King	Total
	..... (Metric Tons.)					
Mothership ...	34,901	13,013	4,908	647	105	53,574
Gillnet 1/	1,798	13,118	49,316	3,632	362	3/68,226
Longline 2/	39	2,723	11,155	7	39	13,963
Coastal trap ...	-	257	9,644	-	4/	9,901
Total	36,738	29,111	75,023	4,286	506	145,664
1/Land-based fishery conducted south of 48° N. latitude and east of Kurile Islands and Eastern Hokkaido. That part of this fishery between 48° N. and 45° N. governed by Russian-Japanese Fisheries Treaty.						
2/Land-based fishery conducted south of 45° N. latitude off Eastern Hokkaido. This fishery wholly outside of Russian-Japanese Fisheries Treaty waters.						
3/Figures include 11,355 metric tons of salmon taken in Russian-Japanese Fisheries Treaty waters (between 48° and 45° N. latitude).						
4/Figures include catch for period of January-July 1961.						

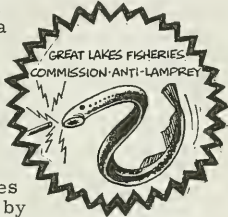
interpretation of data. The Soviet Union claims that the Japanese high-seas fishing has caused an unprecedented decline in the abundance of salmon stocks, a claim strongly refuted by Japan. Japan is taking the position that it is undeniable that the abundance of pink salmon, for example, has declined in recent years, but it is not altogether possible to say on the basis of available data that the 1961 pink salmon run was any worse than the parent run in 1959, and asserts that natural mortality must also be taken into account in evaluating the status of the salmon resources. (*Nippon Suisan Shimbum*, December 20; *Suisan Tsushin*, December 19, 1961.)

Note: See *Commercial Fisheries Review*, April 1961 p. 46.

INTERNATIONAL GREAT LAKES FISHERIES COMMISSION

INTERIM MEETING OF COMMISSION:

An interim meeting of the International Great Lakes Fishery Commission was held in London, Ontario, November 29-30, 1961. Reports on the progress of the sea lamprey control program were made and they presented a much more optimistic picture than in previous reports. Evidence based upon recent scarring of Great Lakes trout and lake herring by lamprey indicates that the lamprey population has been reduced substantially. The true de-



cline in lamprey abundance cannot be accurately predicted on the basis of these preliminary data and will not be available until July 1962. Nevertheless, these preliminary data are very encouraging and, on the basis of these findings, the Commission recommended to the States the elimination of all fishing for lake trout, except that necessary for proper biological sampling of the lake trout populations. Thus, for the first time the Commission has publicly recognized evidence of lamprey control and is recommending regulations which will enhance the trout rehabilitation program.

The second objective of the Convention, which is to recommend to the States long-range programs to achieve coordinated conservation and utilization of the fisheries resources of the Great Lakes, is also being studied by the Commission. Eastern States bordering Lakes Erie and Ontario have felt that a disproportionate share of the attention of the Commission has been placed on sea lamprey control. The action which emphasizes the establishment of scientific committees on each lake to study long-range programs has brought much favorable comment from advisers of the Eastern States.

In general, the meeting was perhaps the most significant held yet by the Commission and the results reported were the most encouraging.

FOOD AND AGRICULTURE ORGANIZATION

ELEVENTH SESSION OF CONFERENCE:

The Food and Agriculture Organization of the United Nations held its Eleventh Conference in Rome, Italy, from October 20 to November 23. This Conference is held once every two years to enable member countries of FAO to review past programs, determine the program of work and the budget for the coming two years, and to consider long-range programs. Programs were discussed fully in technical committees, one each for Fisheries, Agriculture, Forestry, Nutrition, Economics, and Information and Publications.



Representatives from 43 countries attended the meetings of the Technical Committee on Fisheries to consider the program of work for FAO's Fisheries Division. U. Khin (Burma) was elected Chairman, Thomas S. Leach

International (Contd.):

(United Kingdom) and Joran Hult (Sweden), Vice-Chairman, and Sidney Shapiro (United States), Rapporteur. Representatives from the developing countries made strong statements requesting FAO assistance in developing the fisheries of their countries.

The report of the Technical Committee on Fisheries was approved by the FAO Conference with only several minor changes. A summary of the highlights of the report follows:

Attention was drawn to the doubling of the world's annual fishery production during the past dozen years to 38 million tons, a possible further increase to as high as 70 million tons by the end of the next decade or two, and the problems that would arise in utilizing this expanded production effectively. FAO's Fisheries Division was commended for its past and present programs and for the good balance in programs that was proposed for the coming two years.

The Fisheries Committee discussed the relationship between the Fisheries Division's regular program and aid programs, such as the Freedom-from-Hunger Campaign, Expanded Program of Technical Assistance, U. N. Special Fund, and *ad hoc* aid to member countries. The Fisheries Division was asked to evaluate the effect of such programs on the regular program, and to make recommendations for future appropriate consideration. Annual reviews of the status of the aid programs would also be prepared by the Division, and should prove useful in making recommendations for coordinating aid programs with the regular program, and also with those conducted by the United States and other governments.

The Fisheries Committee dealt with a number of specific programs of direct concern to United States Government fishery agencies and the fishing industry. Among the most important items were:

1. The Fisheries Committee recommended the establishment of an Advisory Committee on Marine Resources Research (which will consist of not more than 15 members) and also a Panel of Experts to deal with other subjects besides marine resources research, for example technological and economic matters. This arrangement will en-

able the Fisheries Division to obtain the advice of world-renowned experts on a continuing rather than on an *ad hoc* basis in all fields of fishery development. As finally worded, the Conference authorized and requested the Director-General under Article VI, paragraph 2, of the FAO Constitution to establish this Advisory Committee. The Conference also stipulated that members of the Advisory Committee and the Panel of Experts should be drawn from governmental and nongovernmental bodies of FAO Member Countries.

2. The Fisheries Committee developed working relations between FAO and UNESCO's Intergovernmental Oceanographic Commission in the field of oceanography. In accord with a resolution adopted at the first meeting in Paris (October 19-27) of the Intergovernmental Oceanographic Commission (IOC) on relationships between that organization and other organizations, the United States Delegation at the meetings of the Technical Committee on Fisheries urged FAO's Fisheries Division to cooperate fully in IOC programs so that the fisheries aspects of oceanography could be properly integrated with physical, chemical, and other aspects. The Technical Committee adopted this proposal, and also suggested that the Advisory Committee on Marine Resources Research could well be useful in advising IOC in this respect. *Ad hoc* cooperation between IOC and FAO has already been established and is to be continued. The Technical Committee on Fisheries also recommended that the Director-General of FAO should invite working parties and expert panels of IOC to use the facilities of the Fisheries Division.

3. The Technical Committee noted the useful recommendations of the International Conference on Fish in Nutrition, and urged the Director-General of FAO to implement these recommendations, if possible. The Advisory Committee on Marine Resources Research will be asked to evaluate the potential productivity of the world's aquatic resources and to consider methods of using this production efficiently. Education and training of fishermen, fish handlers, and processors had also been stressed in the recommendations of the Nutrition Conference.

4. The Thirty-Sixth Session of the FAO Council had already given strong approval for the Director-General of FAO to initiate action programs by fishery technologists and economists, in collaboration with the Nutri-

International (Contd.):

tion Division, for the testing and promotion of fish protein concentrates for human consumption. The proposed programs are to include palatability and acceptability tests, controlled clinical and mass-feeding tests, and public education and promotion campaigns. Technical details concerning implementation of such programs were referred to the Technical Committee on Fisheries. The programs will be conducted under the Freedom-from-Hunger Campaign, and the active participation of industry and of WHO, UNICEF, and other organizations in the United Nations family will be sought. Fishery advisers on the United States Delegation held a series of meetings with the staff of the Fisheries Division on such matters as contributions from industry, the types of fish protein concentrates that will be used, and other technical and operational procedures. Action programs are soon to be initiated in Chile and Peru.

5. Two items on the agenda of the FAO Conference were concerned with the establishment of FAO regional fisheries commissions--one for West African countries and one for the countries bordering the South-West Atlantic. U. S. interest in these commissions stems from extensive aid programs to countries in those regions and from specific interest of the United States fishing industry in the developing fisheries of Africa and Latin America.

A resolution was adopted which now establishes a new FAO Regional Fisheries Commission for Western Africa. The resolution provides observer status for member countries of FAO that are not regional members of the Commission. The terms of reference for the establishment and operation of the Commission follow closely the recommendations of a meeting convened by the Director-General of FAO at Dakar, Senegal, in May 1961.

The FAO Conference considered a draft resolution which would establish a regional commission to be known as the "South West Atlantic Fisheries Advisory Commission." Brazil, Uruguay, and Argentina supported the resolution, as drafted. The United States spoke in favor of establishing a fisheries commission for the South American countries, provided that a majority of the countries in the region supported such a commis-

sion. However, in view of the difficulties that may arise with regards to the terms of reference, membership, geographical extent, and other matters, the United States suggested that the Conference agree in principle with the draft resolution, and authorize the Director-General to establish the Commission on the basis of statutes drawn up in consultation with the FAO Committee on Constitutional and Legal Matters. The United States proposal was adopted.

6. The Fisheries Committee commented favorably on previous worldwide meetings convened by FAO. Preparations for holding an FAO World Meeting on the Biology of the Tunas and Related Species are already under way; the United States will host this meeting at the Scripps Institution of Oceanography, La Jolla, Calif., in July 1962. Because the workload in preparing and conducting such meetings and in publishing the final results is considerable, it was suggested that, in the future, meetings be scheduled only as necessary to meet the need for inquiry into new advances in scientific and technical development. It was also suggested that regional meetings be held in preparation for worldwide meetings. The Committee subscribed to the holding of future biological meetings, for example on hake and shrimp, and to a symposium on fresh-water fish culture in 1964, all subject to the availability of funds. Other international meetings urged by the Fisheries Committee were a symposium on the role of fundamental research in the successful utilization of fishery products (a recommendation of the International Conference on Fish in Nutrition), an International Fishing Gear Congress in 1963, and a world meeting on fishery administration in the 1964-65 biennium. The possibility of holding a world symposium on fisheries oceanography in 1964 or 1965 will be explored.

Membership in the Food and Agriculture Organization has now increased to 104; 16 of these are new members mainly from Africa. FAO has grown in stature, and its prestige among developed and developing countries has increased even during the past few years. The budget appropriation for 1962 and 1963 is about 30 percent more than was voted for the previous two years--1960-61. The Fisheries Division's program of work is expanding and can be expected to expand at an even greater rate as world fishery production increases.

International (Contd.):

Fisheries are a primary renewable resource and developing countries are turning to those resources as one of the first items in their national development programs. Logically these countries are looking to FAO for advice and guidance in biological, oceanographic, technological, and economic matters relating to fishery development. FAO's fisheries work is not confined to the developing countries. In the developed countries, new techniques and increased production are constantly creating crises in the distribution and marketing of certain abundantly-produced fishery products. FAO has in the past (e.g., the International Conference on Fish Meal held in March 1961) offered services to assist in improving the distribution and marketing of fishery products. More demands for this and other types of services can be expected in the future.

Note: See Commercial Fisheries Review, January 1962 p. 43.

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MARINE RESOURCES ADVISORY COMMITTEE APPROVED BY FAO COMMISSION:

An Advisory Committee on Marine Resources Research to aid FAO's Fisheries Division in assessing fish stocks and in oceanographic research has been approved by Commission Two, meeting in Rome in conjunction with FAO's 11th Conference.

Commission Two, which considered the Fisheries Division's entire program of work for 1962/63, also approved a fisheries advisory commission for the southwest Atlantic. This commission would function similarly to other FAO regional councils.

In describing the work of the proposed Advisory Committee on Marine Resources Research, the Director of the Fisheries Division told the delegates that the committee's first function would be to advise on the best way to use money and manpower available to further fisheries research in the marine fisheries field.

"Mainly, the commission would help the Fisheries Division's Biology Branch in preparing its program to aid both intergovernmental and international organizations in marine resources research," said the Director.

"We have already been cooperating with these organizations, but the magnitude of this work and the almost explosive growth in oce-

anographic research has made this committee necessary."

As approved by Commission Two, the advisory committee would be composed of about 10 leading fisheries scientists from countries which are either members of FAO or the U. N. At first, it would meet once a year.

Commission Actions: In other actions, the Commission urged the holding of a symposium on fresh-water fish culture in 1964, and that the possibility of holding a world symposium on fisheries oceanography sometime in 1964/65 be explored. It also approved holding a World Scientific Meeting on the Biology of Tuna in 1962, an International Fishing Gear Congress in 1963, and a world meeting on fishery administration during 1964-65. Further work on promoting the human consumption of fish protein concentrates was also approved.

The Commission recommended that more attention be given to providing bibliographic and other reference materials--for example, handbooks, lists of wholesale markets--in the field of fisheries economics where such a service is almost non-existent.

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

FIRST SESSION HELD IN PARIS:

The first session of the Intergovernmental Oceanographic Commission (IOC) was held in Paris, October 19-27, 1961. The session was attended by representatives from 40 member governments, 4 observer governments, 6 specialized agencies of the United Nations, 10 intergovernmental organizations and nongovernmental organizations, and the UNESCO Secretariat.

The session helped clarify the special relationship of the Commission to UNESCO as prescribed in the statutes of the Commission. The Acting Director General of UNESCO stated his view that although the Commission was established by resolution of the General Conference of UNESCO to function within the framework of UNESCO, the Commission should in fact accomplish the scientific and technical aspects of its work as though it were outside UNESCO. UNESCO, on its part, would supply the necessary housekeeping and secretarial services to the Commission as well as give it general policy guidance. This unique relationship was reflected in the

International (Contd.):

Rules of Procedure adopted by the Commission.

No definite decision was taken by the Commission to establish advisory bodies on oceanography. In a unanimously approved resolution, the Commission invited the United Nations and its specialized agencies to cooperate with the Commission; expressed the hope that interested specialized agencies such as the Food and Agriculture Organization (FAO) and the World Meteorological Organization (WMO) would designate members of their secretariats to cooperate actively with the Secretariat of the Commission, in a manner to be decided by agreement between those agencies and UNESCO; requested the Members to submit to the Secretariat, for consideration at the second session of the Commission, their views on the advisory channels to be established; and allowed the Bureau and the Secretariat of the Commission, during the interim period, to seek and receive advice on oceanography from all sources. The United States Delegation was successful in obtaining general acceptance by the Commission of the particularly significant role which FAO could play in oceanography and more specifically in the field of fishery, oceanography, and the special competence of the Special Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions (ICSU) in the other aspects of oceanography.

The Commission took the first steps to coordinate national and regional programs in oceanography and to establish the organizational mechanism, within the Commission, which could develop an integrated, well-coordinated international program in oceanography. In this connection, the Commission unanimously adopted 9 resolutions.

Also unanimously adopted were a resolution on the better utilization by member governments of oceanographers and a resolution recommending that less developed countries interested in oceanography submit requests for assistance in oceanography to the United Nations Special Fund and Expanded Program of Technical Assistance and requesting the Director General of UNESCO to consider the possibility of increasing or modifying the UNESCO program on oceanography to give more assistance to the developing countries in that field.

The work of the session was expedited by the establishment of three working groups on (1) Fisheries Aspects of Oceanography and relationships between IOC and other International Organizations; (2) Cooperative International Programs of Oceanic Investigations; and (3) Coordination of National Programs and Consideration of Technical Questions.

The Commission also established a consultative committee to advise and assist the Bureau during the period prior to the second session of the Commission.

The principality of Monaco invited the Commission, through the Director General of UNESCO, to hold its second session at Monte Carlo. The Commission, however, decided to hold its next session in Paris sometime in the autumn of 1962. (United States Embassy, Paris, November 24, 1961.)
Note: Also see Commercial Fisheries Review, January 1962 p. 44.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETS:

The Fisheries Committee of the Organization for Economic Cooperation and Development met at Paris, France, December 13-14, 1961, to consider the 1962 program of work and a study of subsidies and other financial supports to the fishing industries.

GENERAL AGREEMENT ON TARIFFS AND TRADE

REPORT ON NINETEENTH SESSION:

New procedures for future tariff reductions, special measures to achieve broader access to world markets for agricultural products, and intensified efforts to expand the export earnings of less-developed countries were the central topics considered by the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) at their Nineteenth Session which ended in Geneva on December 9, 1961. Each of these matters has been the object of intensive study by the Contracting Parties under their Program for the Expansion of Trade. They were further considered at the GATT Ministerial Meeting on November 27-30, and in accordance with decisions adopted by the ministers, the Contracting Parties approved action programs for intensified efforts to expand world trade.

Meeting from November 13 to December 9, contracting parties and governments associated with the GATT called a recess in their regular session so that trade ministers might

International (Contd.):

meet to provide the necessary additional policy guidance for further steps to carry forward the GATT's trade expansion program.

In addition to work related to the Ministerial Meeting, the Contracting Parties at their Nineteenth Session dealt with an extensive agenda of some 60 topics including such matters as regional economic arrangements, quantitative import restrictions, the application of GATT trading rules to Japan by all contracting parties, and the welcoming of a new nation--Tanganyika--as the Fortieth Contracting Party to the GATT.

Perhaps the most far-reaching actions taken by the Contracting Parties, however, were those directed to Ministerial conclusions on the trade problems identified in the work of the Program for the Expansion of Trade and the new tasks arising from these conclusions.

The ministers reaffirmed their confidence in the General Agreement as the basis for the trading relationships of their countries and agreed that steps should be taken to increase its effective application in the three fields of action (tariff reduction, trade in agriculture, and trade with the less developed countries) which were submitted to the ministers for their consideration. The ministers adopted four conclusions, together with recommendations for additional action by the Contracting Parties:

(1) The multilateral reduction of tariffs on a most-favored-nation basis should be continued, but new techniques should be adopted, suited to the changes that had taken place in world trading relationships. In this connection one of the techniques most prominently mentioned by ministers was some form of across-the-board or linear tariff negotiation. Accordingly, the Contracting Parties established a working party on procedures for tariff reduction, which will meet in the near future to examine new procedures and techniques for the further reduction of tariffs on a most-favored-nation basis.

(2) Having expressed great concern over the degree and extent of agricultural protectionism, the ministers requested that the Contracting Parties adopt procedures designed to form the basis for the negotiation of "practical measures for the creation of

acceptable conditions of access to world markets for agricultural commodities."

(3) The ministers' discussion of obstacles to the trade of less-developed countries reflected widespread concern that the present rate of growth of the export earnings of the less-developed countries is not keeping pace with the growth of their foreign exchange requirements and recognition that aid can be no substitute for trade in the financing of economic development. Accordingly, the ministers adopted a United States-sponsored declaration on promotion of the trade of less-developed countries. The declaration recognizes the need for a special effort by all governments to expand the export earnings of the less-developed countries, particularly through providing improved access to markets, and sets forth certain guiding principles to this end. The ministers further agreed that their governments should observe these principles as fully as possible, with the aim of reducing obstacles to the trade of the less-developed countries in the near future. Moreover, in response to an appeal from the less-developed countries for some concrete measures of assurance that early progress will be made, the ministers asked the Contracting Parties to draw up specific programs of action for the reduction of trade barriers and to establish procedures for keeping under review the actions taken by individual governments to improve market opportunities for the less-developed countries.

Besides adopting the declaration on the promotion of trade of less-developed countries, the Contracting Parties agreed that preliminary arrangements for future action programs envisaged by the ministers would be undertaken at a meeting of the GATT's Committee III prior to February 1962. The Contracting Parties also accepted the conclusion of most of the ministers that the question of duty-free entry for tropical products should be given careful consideration.

Finally, the ministers considered the situation resulting from the fact that the GATT was not being applied to trade relations between Japan and some of the contracting parties. Some ministers expressed the hope that early action could be taken by the contracting parties concerned to enable Japan to participate fully in the GATT, and agreed that such action would greatly add to the effectiveness of the GATT. The United States strongly supported this conclusion.

International (Contd.):

Other noteworthy trade policy matters before the Contracting Parties were regional trading arrangements, including the European Economic Community (EEC), the European Free Trade Association (EFTA), and the Latin American Free Trade Area (LAFTA): programs designed to eliminate or significantly reduce quantitative import restrictions still imposed by some contracting parties; and a new free trade area established between Sarawak and North Borneo. Decisions were also taken agreeing to the accession to the GATT of Israel and Portugal upon the completion of certain formalities relating to tariff negotiations both countries completed during the 1960/61 GATT tariff conference.

EUROPEAN FREE TRADE ASSOCIATION

**COUNCIL ACCELERATES
10 PERCENT TARIFF CUT:**

The European Free Trade Association (EFTA) Council of Ministers met in Geneva, November 20-21, 1961, and decided to cut tariffs among EFTA members by a further 10 percent in 1962, in order to keep pace with similar tariff cuts in the Common Market. This marked a steep acceleration in tariff cutting since, under the Stockholm Convention (EFTA's "constitution"), the next tariff cut was not due until July 1, 1963.

The first EFTA tariff cut, one of 20 percent, was made on July 1, 1960, less than two months after EFTA came into being. The next cut, one of 10 percent, was scheduled for January 1, 1962, but was actually put into effect on July 1, 1961.

The new 10 percent cut--bringing the total to 40 percent--will be implemented by Denmark, Portugal, Sweden, Switzerland, and the United Kingdom on March 1, 1962, and by Austria and Norway not later than September 1. (EFTA Reporter, November 29, 1961.)

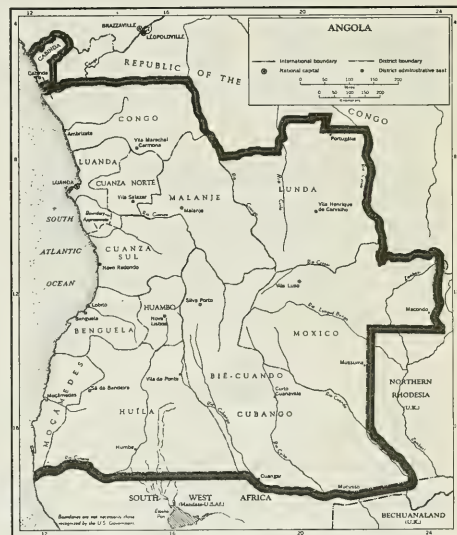
Note: See *Commercial Fisheries Review*, August 1961 p. 50.

**Angola****GOVERNMENT PLANS FOR
FISHERIES DEVELOPMENT:**

As a part of an over-all plan for improving the economic status of the country, the

Government of Angola has outlined a fishery development plan.

In ocean fishing it plans to (1) intensify and orient studies of ocean biology, especially those regarded as economically useful; (2) introduce new methods (e.g. trawling) to permit the catch of more valuable species and in more abundant quantities; (3) improve present fishing methods; and (4) improve and equip processing plants for more efficient utilization of the fish catch.



In inland waters, the Government plans to (1) increase fish production; and (2) intensify fish culture in ponds as a means of supplementing the diet of people in the interior. (United States Consulate, Luanda, October 24, 1961.)

**Benelux Countries****CANNED FISH IMPORT TARIFFS
TO BE RAISED:**

The Benelux countries (Belgium, the Netherlands, and Luxembourg) are reported to have informally approved higher tariff rates on imports of canned food effective January 1, 1962, according to information released by the Belgian Embassy in Tokyo, Japan. The

Benelux Countries (Contd.):

new tariff schedule as it affects certain canned fishery products is:

Product	Present Tariff Rate	New Tariff Rate
	... (Percent ad valorem) ...	
Canned salmon	0	6
Canned sardine	20	21.5
Canned herring	20	23

The Benelux countries raised their national tariff rates to bring them a step closer to the proposed European Economic Community (Common Market) rates. The Common Market tariff rate for canned salmon imports is 20 percent; consequently, these countries can again be expected to raise their national tariff rates for canned salmon imports in the future.

Japanese canned fish producers are pressing their Government to establish measures to cope with these tariff increases, for the Benelux nations are important markets for Japanese canned salmon, and this tariff increase will hurt Japanese canned fish producers, particularly since the British market is quite depressed. (Nippon Suisan Shimbun, December 6, 1961.)



British Guiana

JAPANESE FISHERY EXPERT FOR BRITISH GUIANA:

The Japanese Overseas Fisheries Cooperative Association planned to send a Japanese fishery expert, employed by a large Japanese fishing company, to British Guiana in December 1961. The expert, to be sent in response to a British Guiana request, will be employed by a British Guiana company under a two-year contract and will serve as master of a trawler newly added to that company's fishing fleet. He is the second Japanese fishery expert to be sent to British Guiana. (Shin Suisan Shimbun Sokuho, November 25, 1961.)



Canada

ANNUAL MEETING OF FISHERIES RESEARCH BOARD OF CANADA:

Increased efficiency in fishing methods, improvements in fish handling, and efforts to overcome water pollution were commended by the Canadian Fisheries Minister as among the more valuable contributions of the Fisheries Research Board of Canada. The Minister spoke on January 4, 1962, at the opening of the annual meeting of the Board in Ottawa, Canada. The meeting ended on January 8.

Studies toward making the best and fullest possible use of the fish catch are most important, he said, as the gap between available food and the needs of the growing number of people continues to widen. "The Board's scientists have in my view contributed very substantially already in improving methods of fish handling, preservation and processing, and in developing byproducts as well," he said. "The proposed studies leading toward increasing our fishing efficiency in international waters so that Canadian fishermen can continue to reap their fair share of the international catch in the face of growing competition are, in my view, also very important. That a concerted effort toward achieving this is being planned by the Board, the Department of Fisheries, and other government agencies is highly commendable."

The Minister referred to the dangers of water pollution, saying that progressive industrialization and urbanization of a country was often paralleled by threatening pollution of its waters. "Our particular responsibility is on the effects of pollution on aquatic life, and our job is one of prevention rather than correction where this can be done. But as new chemicals and new pollutants are being added to our waters daily we must at least be able to recognize and neutralize, if we can't avert. This is not an easy task, but it is one where we cannot sidestep responsibility."

The Board is made up of 16 members in addition to the full-time chairman. The members appointed by the Minister of Fisheries for five-year terms and serve without pay. They are chosen from Canada's leading scientists, the fishing industry, and the Federal Department of Fisheries.

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Canada (Contd.):

BRITISH COLUMBIA SALMON PACK, 1961:

Salmon, British Columbia's principal dollar earner, experienced the second best year since 1958 when 1,900,025 cases were packed. The 1961 pack was up 122 percent from that for 1960 and was 30.3 percent more than

have been brought about by the development of refrigerated sea-water transportation and storage of fish, a January 4, 1962, news release from the Canadian Department of Fisheries pointed out.

One refrigerated sea-water salmon packer (transport vessel), with a capacity of 450,000

British Columbia Canned Salmon Pack, 1956-61

	1961	1960	1959	1958	1957	1956
	(Standard Cases—48 1-Lb. Cans)					
Sockeye (red)	398,303	226,905	256,170	1,074,305	228,452	320,096
Spring (king)	7,488	5,913	15,230	10,550	10,481	11,671
Steelhead	979	500	867	1,205	1,126	1,254
Blueback	12,521	23,456	10,114	11,103	12,147	10,549
Coho (silver)	228,213	68,891	202,991	120,424	180,911	207,366
Pink	661,103	219,624	458,597	451,802	751,608	363,633
Chum (keta)	95,387	86,800	133,128	230,636	239,539	203,710
Total	1,403,994	1,632,089	1,077,097	1,900,025	1,424,264	1,118,279

1/Includes fish canned from previous year's frozen fish.

that for 1959. The 1961 pack was almost 74 percent of the pack reported in 1958. The leading species packed was pink salmon, followed by red or sockeye, coho or silver, and chum or keta.

Note: See Commercial Fisheries Review, January 1961 p. 57.

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DEVELOPMENT OF ACTIVE TUNA FISHERY IN PACIFIC:

The development of an active tuna fishery in the Pacific based in British Columbia may be brought closer to reality by work now being carried out by the Fisheries Research Board of Canada at its technological station in Vancouver.

This work, described at the Board's annual meeting in Ottawa, involves the design of freezing equipment which can be used at sea to preserve the catch and enable vessels to range far offshore. The Board's technologists are working with the Industrial Development Service of the Federal Department of Fisheries on the project, which in its present state is intended to equip four big seiners with suitable freezing systems which will differ in certain important respects from those now in use on United States tuna vessels. The equipment being designed is felt to have many advantages for local vessels.

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REFRIGERATED SEA WATER USED TO TRANSPORT AND STORE SALMON:

Revolutionary changes in the handling of salmon in certain areas of British Columbia

pounds of fish, completed in 1961, is giving thoroughly satisfactory performance. Other packers already in use are being converted to employ the same engineering principles, which were developed by the Fisheries Research Board of Canada at its technological station in Vancouver. Similar application of refrigeration techniques have been or are being made to halibut fishing vessels and salmon trollers.

This industrial application of the results of technological investigations was reported at the annual meeting in Ottawa of the Fisheries Research Board of Canada. Experiments at the Vancouver station over the past several years have resulted in principles which include the means of driving equipment for the vessels, the design of heat exchange units, and construction of tanks and piping with a view to ease of sanitation.

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ANTIBIOTICS USED TO PRESERVE FISH FILLETS:

An example of the adoption by the Canadian fishing industry of the developments of research at the Vancouver, B. C., technological station is the use of antibiotics as preservatives for food fish. This method is now being used extensively for fillets in the Maritime provinces of Canada, according to a January 4, 1962, news release of the Canadian Department of Fisheries.

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Canada (Contd.):

VACUUM METHOD OF CANNING HERRING DEVELOPED:

A method of canning herring developed by the Technological Station of the Fisheries Research Board of Canada in Vancouver, B. C., has been brought into commercial use by a British Columbia cannery. The method, involving a stage in processing where the herring is placed under vacuum, produces a firmer, more palatable product than older methods. It was described at the Board's annual meeting in Ottawa.

The vacuum is drawn immediately after precooking, when the herring are in open, inverted cans in the steam retort. Vacuum is maintained for several minutes after which sauces are added, the cans sealed, and the cooking process completed.

Among the advantages of the vacuum method is a rapid cooling effect which firms up the fish. Relatively simple adjustments and equipment are necessary to convert the steam retorts to the vacuum process.

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NEW METHOD OF UNLOADING SALMON FROM VESSEL TO REDUCE HANDLING:

A new method of unloading salmon that can substantially reduce or eliminate fish handling from the vessel to the plant is the subject of an engineering project at the Technological Station of the Fisheries Research Board of Canada in Vancouver, B.C.

The idea of such a method, involving the use of pressurized containers aboard vessels, was initiated by a British Columbia fishing company. Engineers at the Technological Station designed and tested a working model, based upon the original suggestion but involving important changes in design. The project was described at the annual meeting of the Board.

The model worked effectively with herring and a full-scale system was installed on the salmon packer *Nootka Chief*. In practical use, the unloading system has duplicated the success of test runs on the working model.

Investigation into the engineering and economic features of the equipment are to continue.

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"BLOWN" FISH OILS PRODUCED BY SCIENTISTS:

"Blown" fish oils that could be used as additives to conventional lubricants have been produced by scientists of the Halifax technological station of the Fisheries Research Board of Canada in their search for new ways to develop byproducts from the fishery resources of the Atlantic. Although fatty oils have been used as lubricants for centuries, often in the form of soaps, there has been relatively little use for marine oils for lubrication.



However, the Halifax station's scientists have concluded successful experiments with cod-liver oil and herring oil which may interest processors and oil companies in the use of these products as additives to lubricants. Details of the project were given in Ottawa at the annual meeting of the Research Board.

Before the advent of petroleum many fats and oils from plants and animals, including even butter, were used as lubricants. Within the last few decades the direct use of these materials as lubricants has practically vanished. Some, however, are still used as additives in certain lubricants since they adhere to metal surfaces and improve the stability of the oil layer between the surfaces. The oil most commonly used for this purpose today is derived from rapeseed.

To improve the characteristics of these oils, large quantities of air are blown through the oils at high temperatures. This thickens the oil to improve its viscosity characteristics and at the same time stabilizes it against

Canada (Contd.):

further decomposition in operation at high temperatures often found in machines.

Since the cost of "blown" vegetable oil is high as compared to marine oil, it is possible that this fact could create more interest by oil companies in the use of fish oils as additives. The Halifax experiment has shown that by careful processing a "blown" marine oil can be produced that would meet most specifications required by oil companies.

The project has not been geared to produce oil in sufficient quantity for evaluation by oil companies. However, the process has been perfected and is available to Canadian industry if it wishes to use it.

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STUDIES ON HORMONES IN SALMON:

Studies on hormones in Pacific salmon have recently been extended to include the Atlantic salmon. All five species of Pacific salmon die after spawning while many Atlantic salmon do not. The present studies are being undertaken with a view to gaining a better understanding of this phenomenon, and were outlined at the annual meeting of the Fisheries Research Board of Canada.

Results to date show that there is an impaired elimination of hormones in spawned Pacific salmon which does not occur with spawned Atlantic salmon. This research is being carried out at the Board's technological station in Halifax.

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PLANKTON RESEARCH:

Plankton--the very foundation of the pyramid of life in the sea--is the subject of an intensive and stimulating program of research at the Nanaimo Biological Station of the Fisheries Research Board of Canada. Scientists at the British Columbia station are opening the door on increased knowledge of the tiny organisms, both plant and animal, which are at the bottom of the food chain of the sea. These microscopic creatures and plants are present in greater numbers and higher concentration than any other form of life in the ocean. Yet, to the present time, serious gaps exist in scientific information about them.

The current research program in this field, described at the Board's annual meet-

ing in Ottawa, is aimed at finding out as much as possible about these members of the phytoplankton and the zooplankton families--the number of different species, how fast each reproduces, how useful they are in the food chain.

To get this information, completely new techniques of investigation have been developed by scientists at the Nanaimo Station. These include a method of isolating a body of water in a submerged plastic sphere where plant organisms were grown under conditions closely approaching those of nature.

To further laboratory research, electronic equipment has been adapted or developed specially for this purpose. Among the new devices is one which may enable scientists to monitor concentrations of new growths of plant organisms in the sea through aerial surveys.

The significance of these studies is enormous. In effect, the basic foodstuffs of the sea support all marine life, as their presence in quantity or otherwise determines the growth and survival of the next higher organism, and so on.

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EFFECT OF WINDS, TIDES, AND SEASONS ON OCEAN SURFACE CURRENTS STUDIED:

Progress is being made in assessing the uneven lag of various parts of the ocean surface in responding to such forces as winds, tides, and seasons, according to a report to the annual meeting of the Fisheries Research Board of Canada by its Pacific Oceanographic Group.

Changes in barometric pressure cause winds, it was explained, and winds cause surface currents and a degree of drift which must be taken into account in navigating a vessel. But there is enough lag in each step from cause to effect to enable an expert weatherman on land to collect barometric reports, work out varying probable drifts for a number of different areas, and publish monthly charts.

This interplay of forces is fairly uniform on the open ocean, it was further explained, but nearer the coast is greatly complicated and locally varied by the shape of the sea bottom and the coastline, which may increase or diminish the local effect of wind and tide

Canada (Contd.):

and lengthen or shorten the period of lag in the sea's response.

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NEW RESEARCH VESSEL BEING BUILT:

Construction was started early in January 1962 on a new ocean-going research vessel--the CGS "G. B. Reed." The G. B. Reed is to operate in North Pacific waters.

The 177-foot vessel, which will cost approximately \$1.8 million, is being built in Victoria, B. C. The construction schedule calls for launching in September 1962 and delivery to the Fisheries Research Board of Canada in November.

The G. B. Reed will be a sistership to the Board's A. T. Cameron which operates in the Northwest Atlantic.

The new vessel will be, in effect, a floating scientific laboratory, and her facilities will incorporate the very latest equipment to enable scientists to carry out work at sea. Investigations in the North Pacific Ocean will include those required of Canada under the International North Pacific Fisheries Commission.

The G. B. Reed will have a cruising range of 8,500 miles and trips lasting 4 to 5 weeks will be possible. It is estimated that the vessel will be at sea for up to 250 days each year. A single high-powered Diesel engine will give the ship a cruising speed of 12 knots. Like the laboratory facilities, the navigational and fish-finding equipment will be the most modern available.

The vessel will be equipped with bottom and midwater trawls, gill nets, long lines, and other specialized fishing gear as well as winches and rigging for conventional oceanographic survey operations.

The vessel will join a fleet of four research vessels operated by the Fisheries Research Board of Canada on the Pacific Coast. They are the A. P. Knight, the Investigator I, the Alta, and the Noctiluca. The largest is the A. P. Knight, a 77-footer.

The home port of the G. B. Reed will be Victoria, B. C., but the scientific staff will

be from the Nanaimo Biological Station of the Fisheries Research Board of Canada.

Note: See Commercial Fisheries Review, August 1961 p. 59.

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COMMERCIAL FISHING AREAS EXPANDED IN NORTHWEST TERRITORIES:

Commercial fishing in the Northwest Territories, hitherto restricted to Great Slave Lake in Mackenzie District, has been expanded to include 8 designated areas in the Mackenzie and Keewatin districts on a rotating basis, the Canadian Department of Fisheries announced early in December 1961.

Quotas computed on annual catch limit rates have been set for each of the lakes in the 8 areas. In 6 of the areas each lake will be open for two years or until its quota has been filled, after which it will be closed for 4 years. In the other two areas, the maximum two-year opening will be followed by a two-year closure.

Commercial fishing in some lakes, designated as experimental areas, will be confined to a short summer season. In the remainder, fishing will be allowed on a year-round basis within the restrictions of the quota system.

Operations on Great Slave Lake, which has been fished commercially for the past 16 years, will continue to be governed by existing regulations.

The only other commercial fishing operations in the Northwest Territories are the Arctic char fishery recently developed through Eskimo cooperatives. (The Fisherman, December 8, 1961.)

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NEW BRUNSWICK FISH MEAL PRICES, DECEMBER 1961:

Fish-meal prices (60-percent protein) quoted by New Brunswick producers late in December 1961 and late in November 1961 averaged about C\$120 a short ton (\$2.00 a protein unit) for both exports and domestic sales. The price has remained the same since late July 1961. (United States Consulate, Saint John, N. B., Canada, December 28, 1961.)



Denmark

FLATFISH FILLETING MACHINE TESTED:

A filleting machine for flatfish was reported operating successfully for two weeks as of mid-December 1961 in the plant of the Esbjerg fishery exporter who invented it, according to the November 30 issue of the daily newspaper, *Vestkysten*. The inventor, I.C.C. Dyekjaers, reports the machine, which was constructed in Lubeck, West Germany, cuts fillets in an excellent manner but a number of months of operation under regular production will be required before it can be fully tested. Numerous filleting plants in Denmark have ordered the new machine from the Lubeck factory but the latter will await further operating reports before making deliveries in any quantity. (Fisheries Attache, United States Embassy, Copenhagen, report of December 13, 1961.)

4TH INTERNATIONAL FISHERIES TRADE FAIR:

The 4th International Fisheries Trade Fair 1962 will take place in Copenhagen, April 14-23, 1962. Billed as the world's largest trade fair for fisheries, it will be held in The Forum, Scandinavia's largest exhibition hall. About 85 percent of the exhibition space already has been reserved. In the current list of 115 exhibitors from 14 countries, the United States was represented by five manufacturers as of early December 1961.

Exhibitors plan to show the most recent developments in fishing gear, motors and engines, navigation equipment, processing machinery, etc. At the 3rd Fair, held in Copenhagen, September 25-October 4, 1959, exhibitors reportedly made sales of almost US\$29 million. Visitors are expected from at least 33 countries.

Denmark's Fisheries Minister is patron for the Fair, and it is supported also by the Danish Fisheries Council and the Chamber of Manufacturers. (Fisheries Attache, United States Embassy, Copenhagen, report dated December 5, 1961.)

FISHERY TRENDS, DECEMBER 1961:

Catch in 1961 Sets Record: Preliminary data on Danish fishing craft landings through November 1961 indicate that the 1961 catches of most major species have been significantly larger than in 1960. The year's total will surpass the record landings of 1959 of 638,000 metric tons. Better fish

meal prices favored increased industrial fish landings while the excellent demand for fishery exports expanded food fish production.

Common Market Fisheries Policy: The Danish Fisheries Ministry has not scheduled formal meetings with representatives of other countries for discussions leading to development of a fisheries policy for the Common Market. However, the topic is becoming of greater interest among member and prospective member countries. National fishery representatives do discuss the subject informally at meetings called for other purposes. It undoubtedly was discussed at the committee meeting of fishery administrators in London the week of December 11 under the auspices of the Permanent Commission of the International Fisheries Convention of 1946.

Fisheries Ministry Proposes Aid for Exporters: Two proposals of the Fisheries Ministry to aid Danish fish exporters are expected to be recommended to the Government shortly. One would have the Government assume the cost of the fishery export control expenses which are now met by a two-tenths of one percent tax on exports paid by the exporters. In recent years exports have been valued at more than 400 million kroner (US\$58 million). Thus, the saving to exporters would be over 800,000 kroner (\$116,000). Agriculture is seeking the same relief. The second proposal involves increasing the sum allotted for export promotion from the current 50,000 kroner (\$7,250) to 175,000 kroner (\$25,400) the first year and to possibly 200,000 kroner (\$29,000) annually later.

Costs and Earnings of Fishermen to be Studied: The total income of Danish fishermen has increased this year, making it difficult for them to convince others that the fishing industry has economic problems. The fishermen contend that increases in operating costs far exceed the increases in income but have supplied no specific accounting of their operations which would demonstrate their profits or losses. Earlier attempts to obtain such information were unsuccessful. The Committee on Profits and Loans of the Fisheries Commission (consists of 27 members from the fishing industry, the Parliament, and the Fisheries Ministry; it was established by the Ministry on June 27, 1961) is making a renewed attempt to secure the desired information which is meeting with much greater success in the preliminary stages. Questionnaires were being prepared in December 1961 in final form for distribution.

Minimum Size of Plaice Increased: The Danish Fisheries Association has sent a proposal to its 160 local organizations that the minimum size for plaice (*Pleuronectes platessa*) be voluntarily raised from 26 to 27 centimeters (10.2 to 10.6 inches) in order to decrease market supplies. The order would remain in effect until further notice. Earlier this year the Association sought a minimum price regulation but because of the time required has shifted to a larger minimum size fish.

There were many complaints about the low prices of plaice in 1961 with the smaller sizes selling, at times, at such low levels they were bought for mink food and reduction purposes. It was contended that even the larger more desirable sizes sold, on occasion, for one krone per kg. (6.6 U.S. cents a pound) under what was characterized as a "dumping" price.

The increase in the minimum size is expected to decrease landings significantly. Danish biologists favor the proposal in the interest of greater protection for the resource. The fishery for plaice is Denmark's most valuable single fishery.

Pond Trout Association Formed: Pond brook or rainbow trout growers are forming a new association to handle their mutual interests with governmental authorities, including such problems as tax questions, pollution problems, etc. A former association, which also was concerned with trade problems, disbanded in 1960 after disagreements over marketing matters.

Funds Available for Increasing Fisheries Productivity: Suggestions for the expenditure of 75,000 kroner (\$10,900) for increasing productivity in the Danish fisheries have been invited from the industry by the Fisheries Ministry. The advice

was due December 11, 1961, and was expected to concern exploratory fishing, and improvements in vessel and gear equipment and operations. The funds represent the fishing industry's allotment from a larger fund available to other industries.

Two New Cooperative Filleting Plants Proposed: Fishermen in Esbjerg are considering the establishment of two new cooperative filleting plants. The November "buyers strike," which developed from a dispute over adherence to auction regulations, stimulated the Esbjerg Fisheries Association to initiate a plan for a cooperative filleting plant owned by fishermen. While it is recognized considerable capital will be required, the opportunity to acquire an outlet for their catches, which they will control, has induced more than 30 fishermen to sign up for shares valued at 100,000 kroner (\$14,500).

Andelssildeliefabrikken (The Cooperative Herring Oil Factory) in Esbjerg is one of the world's largest fish meal and fish oil plants. Its management has become interested in establishing a filleting plant because about 50 of its more than 250 shareholders now fish exclusively for food fish rather than industrial fish. Preliminary investigations of the project are under way with regard to construction costs, equipment, markets, etc., so that a comprehensive proposal may be presented to members at the forthcoming general meeting. (December 13, 1961, report from the Fisheries Attache, United States Embassy, Copenhagen.)

Note: Values converted at rate of 1 kroner equal US\$0.145.



El Salvador

SHRIMP FISHERY TRENDS:

Based on preliminary recommendations, the Government as of late 1961 suspended the issuance of new licenses to catch shrimp until a study of shrimp possibilities by an expert of the Food and Agriculture Organization (FAO) had been completed. Considerable interest in El Salvador's lobster potential developed during the last few months of 1961, and many persons are making plans to begin lobster fishing.

Boat owners reported a monthly shrimp catch per boat of up to 9,000 pounds as of December 1961, substantially more than the monthly catch of 4,000 pounds of a few months ago but less than the monthly average of 15,000 pounds for the same period of 1960. It is hoped that the FAO study can shed some light on the cause of this decrease, though some observers believe that it is caused by a combination of climatic factors and the increased number of boats in the fishery.

Interest has also developed in shark fishing possibilities, with several fishermen actively planning expansion in that field. (United States Embassy, San Salvador, December 6, 1961.)



Fiji Islands

GOVERNMENT WELCOMES JAPANESE TUNA FISHING BASE:

Japanese plans to establish a large tuna fishing base, complete with freezing and canning facilities, at Levuka, Fiji Islands, appear to be moving forward smoothly. The seven-man survey team headed by a Japanese Diet member, including two other Diet members and a Fisheries Agency official, returned to Tokyo on December 21, 1961, after a two-week on-the-spot survey in Fiji.

Reportedly, the Japanese delegation met with the Fiji House Speaker, who was said to be greatly enthused over Japanese plans to establish a large fishing base and to emigrate 2,000 Japanese to Levuka over a four-year span. Establishment of the base is most welcome since the Fiji Islands have only one industry--sugar--and plans apparently are being made to widely publicize the affair in Fijian newspapers.

Agreement is said to have been made during this trip to have the proposed Levuka base furnish the Japanese tuna mothership fleets operating in nearby seas with supplies and water. (*Suisan Keizai Shimbun*, December 23, 1961.)



France

FIRST BIENNIAL INTERNATIONAL FISHERIES SHOW:

The first Biennale Internationale des Peches (Biannual International Fisheries Show) will be held at Lorient (Morbihan) on the Atlantic shores of Brittany from May 25 to June 3, 1962. The object of the exhibition will be to publicize and promote everything related to the fishing industry from the supertrawler to frozen packaged fish. The fair is being privately sponsored by the city of Lorient and will be the only large fair in France in this field during the year 1962. The last major French fisheries fair was held about two years ago at Boulogne.

American firms can exhibit directly or through local representatives and applications for space should be made directly to the Secretariat General, Biennale Internationale des Peches, Hotel de Ville, Lorient (Morbihan).

France (Contd.):

Covered exhibits will be housed in exhibit halls to be erected for the event. Each hall will be able to accommodate about 50 stands. Fifteen such halls are planned so as to provide enough space for 750 stands. In addition, there will be ample space for out-of-doors exhibits.

Exhibits will cover all aspects of the fishing industry, including supertrawlers. Included in the displays will be mechanical, electronic, radio, radar, and refrigerating equipment; optical instruments; filleting and processing machinery; deep-freezing equipment; retail refrigerator cases; trucks for transporting fresh and frozen fish; etc. ...

The fair will also be highlighted by gastronomic events and by stands devoted to the art of cooking sea products which should have wide appeal to the general public.

Technical conferences are planned but the program has not yet been announced.

consumed in France, facilities for handling and selling frozen foods, including super markets, are being built very rapidly throughout the country. Production and consumption of frozen fish should enjoy a tremendous development in France over the next few years, and there would seem to be an excellent market potential here for equipment and technical know-how in that field.

A significant portion of the fair is being devoted to new types of fishing equipment including electronic devices. European interest in such equipment is strong. (United States Embassy, Paris, November 27, 1961.)



German Federal Republic

FISH MEAL PRICES, NOVEMBER 29, 1961:

Prices reported at Hamburg Commodity Exchange as of November 29, 1961, for fish meal delivered ex-Hamburg warehouse, or c.&f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton $\frac{1}{2}$	US\$/Short Ton
German	55-60	loco/prompt	577,50	130,98
"	60-65	" "	590,00	133,81
Peruvian	65-70	loco "	585,00	132,68
"	65-70	Dec. 1961	585,00	132,68
"	65-70	Jan. 1962	560,00	127,01
"	65-70	Feb.-July 1962	550,00	124,74
Angola	65-70	Dec. 1961/Jan. 1962	602,50	136,65
Portuguese	50-55	Nov. 1961-Jan. 1962	568,00	128,82
Icelandic herring	70-75	Nov. 1961-Feb. 1962	705,00	159,89
South African	65-70	Dec. 1961-Jan. 1962	595,00	134,95
"	65-70	Feb.-May 1962	580,00	131,54

$\frac{1}{2}$ Values converted at rate of 4,0 deutsche marks equal US\$1.

Note: "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

Representatives from all sectors of France's fisheries industry should be attracted to this fair and numerous industry visitors from other European countries can also be expected. The fair would therefore seem to be an excellent vehicle for promoting fishery equipment and products. According to press reports, firms from 26 countries including Japan, Peru, and the Republic of South Africa have already expressed an interest in participating.

Equipment and techniques used in the packaging, freezing, storing and handling of frozen fish should be of particular interest to the French industry. While frozen fish now represents only a small percentage of the total fish

As compared with November 3, 1961, prices on the Hamburg Exchange on November 29, 1961, were up substantially for every type of fish meal. (United States Consulate, Bremen, December 6, 1961.)

* * * * *

FISH BODY OIL MARKET, SEPTEMBER 1961:

Total West German imports of edible fish body oil in January-September increased from 40,549 metric tons in 1960 to 43,597 tons in 1961; exports increased from 13,367 tons to 15,366 tons. The amount of United States oil in West German imports dropped from 33.8 percent in 1960 to 5.9 percent in 1961, but Peru's share increased from 27.0 percent to 63.8 percent during the same period.

According to the leading local fish oil importer, the use of fish oil in margarine production has been maintained at a fairly steady level by the industry. At present, margarine

German Federal Republic (Contd.):

Table 1 - Federal Republic of Germany Imports and Exports of Edible Fish Body Oils, September 1961 With Comparisons									
Country of Origin	IMPORTS								
	September 1961			Total by Weight		Average Prices 2/			
	September			September		September		September	
	Quantity	Value 1/		1961	1960	1961	1960	1961	1960
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.\$/Lb.)	
Iceland	376.0	173	43	6.1	0.5	460	385	5.2	4.4
Denmark	807.7	390	98	9.9	18.1	642	649	7.3	7.4
Netherlands	349.2	180	45	5.7	2.1	515	563	5.8	6.4
Norway	191.8	188	47	3.1	18.5	980	826	11.1	9.4
United States	1,216.8	636	159	19.8	21.4	523	672	5.9	7.6
Chile	194.8	105	26	3.2	-	539	714	6.1	8.1
Peru	3,204.7	1,796	449	52.2	23.0	560	530	6.4	6.0
Total	6,141.0	3,468	867	100.0	-	565	-	6.4	-
Total September 1960	3,704.9	2,398	600	-	1/83.6	-	647	-	7.3
Country of Destination	EXPORTS								
	September 1961			Total by Weight		Average Prices 3/			
	September			September		September		September	
	Quantity	Value 3/		1961	1960	1961	1960	1961	1960
	Metric Tons	1,000 DM	US\$ 1,000	(Percent)		(DM/Metric Tons)		(U.S.\$/Lb.)	
Netherlands	220.0	118	29	19.8	16.5	587	536	6.7	6.1
Norway	1,116.8	691	173	80.2	83.5	675	619	7.7	7.0
Total	1,336.8	809	202	100.0	-	605	-	6.9	-
Total September 1960	1,880.5	1,237	309	-	100.0	-	658	-	7.5

1/Believed to be the value at port of entry in Germany.

2/Other countries: Great Britain - 12.9 percent; Portugal - 0.3 percent; Argentina - 3.2 percent.

3/Believed to be the value at port of shipment in Germany.

Source: Federal Office of Statistics, Wiesbaden.

Note: Values converted at rate of 4 DM equal US\$1.

manufacturers have large fish oil stocks on hand, which reportedly are sufficient to carry their production through April 1962.

United States menhaden oil is currently offered at \$120 per metric ton (5.4 U.S. cents a pound), c.i.f. Rotterdam or Scandinavian port. But according to the local source, little or no business is transacted on this basis. Some sales of U.S. menhaden oil were transacted early in December 1961 at \$116 per ton (5.3 U.S. cents a pound). Peruvian exporters have contracted sales at \$113-\$114 a ton (5.1-5.2 cents a pound), c.i.f. Rotterdam or Scandinavian port for delivery in May 1962, but the early December 1961 price for Peruvian fish oil was \$116 per ton (5.3 cents a pound). According to the local importer, the headquarters of the largest British user and buyer in London has instructed its West European affiliates, including those in West Germany, to stop buying fish oil until at least January 1962. The British firm will reportedly buy if Peru offers fish oil at \$110 per ton (5.0 cents a pound). German fish body oil early in December 1961 was quoted at about DM 450-460 a metric ton (5.1-5.2 cents a pound), ex factory, but it is difficult to get German oil for delivery before March 1962. The local source was optimistic concerning export possibilities for German oil from the 1961/1962 winter production. (United States Consulate, Bremen, December 6, 1961.)



Ghana

JAPANESE FIRM CONSTRUCTING FISH COLD-STORAGE PLANT:

A large Japanese fishing company as of November 1961 was constructing large cold-storage facilities at Tema, Ghana, to handle the catch of its Atlantic trawler fleet, reported to total six trawlers, mostly in the 2,500-ton class. The company is said to be planning on increasing its trawler fleet in the Atlantic Ocean and may build more freezing plants in West Africa. Reportedly, many other foreign fishing firms are interested in joining the Japanese firm in developing new base facilities in West Africa, particularly after the company announced that it planned to establish a large fishing base at Tema. (Shin Suisan Shimbun Sokuho, November 17, 1961.)

FISHERIES DEVELOPMENT AID FROM DENMARK REQUESTED:

The Danish Ambassador to Ghana in Accra has received a letter from the Ghana Na-

Ghana (Contd.):

tional Cooperative Fishing and Marketing Association, Ltd. requesting assistance in establishing joint fisheries ventures in the territorial waters of Ghana. The Association stated it was the only acknowledged national organization for fisheries in Ghana. It wished to receive offers from recognized fishery companies in important fishing countries for a joint fishery operation conducted under a bilateral agreement giving mutual satisfaction. Denmark was approached because it built fishing craft and fished in open ocean waters. It was hoped that private Danish fishing companies would contact the Association with regard to utilizing the very great resources in Ghana's territorial seas. If this was not possible the Association desired a connection through which arrangements could be made for renting fishing craft.

The request was made public in the Danish press in mid-December 1961 and in fishery trade publications. (December 13, 1961, report from the Fisheries Attache, United States Embassy, Copenhagen.)



Iceland

FISHERIES TRENDS, NOVEMBER 1961:

Iceland's herring catch off the southwest coast as of mid-November 1961 continued favorable--so much so that it was feared there were not sufficient contracts to take care of potential sales of herring for salting, normally the preferred process. Salted herring contracts to that date were for 40,000 barrels to the U. S. S. R., 20,000 barrels to Poland, 20,000 barrels to West Germany, and 4,000 barrels to East Germany.

The press announced on November 21 that a special trawler investigating committee headed by the Director of Fisheries had made recommendations to the Government on drastic measures for assisting the Icelandic trawler industry. The recommendations, which were being studied by the Cabinet, were not revealed.

Possible special subsidies for the trawler industry may be foreshadowed by press reminders that the British Parliament recently passed an Act providing for a 10-year as-

sistance program for the British trawler industry. (United States Embassy, Reykjavik, November 22, 1961.)

EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1961:

Exports of Iceland's most important commodities for January-September 1961 include several fishery items of interest to the United States fisheries. There was a considerable increase in exports of fish meal and herring meal as compared with January-September

Selected Icelandic Fishery Exports, January-September 1961				
Product	Jan.-Sept. 1961		Jan.-Sept. 1960	
	Qty.	Value ¹	Qty.	Value ¹
	Metric Tons	US\$1,000 f.o.b.	Metric Tons	US\$1,000 f.o.b.
Salt herring	19,266	4,015	12,629	1,888
Salt fish	28,243	7,165	21,837	4,837
Stockfish	7,156	3,892	4,202	1,813
Fish on ice	24,326	2,437	16,409	1,274
Frozen fish	31,283	11,005	48,647	13,265
Shrimp & lobster, frozen	354	629	348	550
Herring, frozen	10,069	1,117	5,765	373
Herring oil	11,006	1,515	27,372	2,896
Fish meal	26,694	2,482	8,025	718
Herring meal	22,550	2,713	11,599	1,060
Ocean perch meal	3,581	375	8,368	661

¹/Value converted at rate of 1 kronur equals 2.32 U. S. cents.

1960 (see table), according to the National Bank of Iceland's October 1961 Statistical Bulletin. Exports of frozen fish, herring oil, and ocean perch meal were much lower.

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-SEPTEMBER 1961:

Species	January-September	
	1961	1960
	.. (Metric Tons ¹) ..	
Cod	175,589	220,511
Haddock	27,086	23,963
Saithe	8,374	6,712
Ling	4,034	4,374
Wolfish (catfish)	11,338	7,740
Cusk	3,677	5,487
Ocean perch	23,464	40,020
Halibut	1,214	1,187
Herring	250,805	111,084
Shellfish	2,478	1,819
Other	7,712	5,581
Total	515,771	428,478

¹/Except for herring which are landed round, all fish are drawn weight.

FISHING EXCEPTIONALLY GOOD IN 1961:

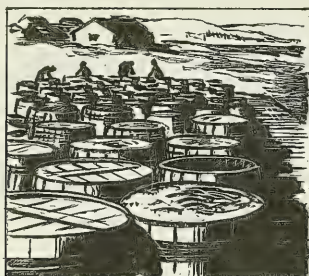
From the viewpoint of total fish landings as well as for both the north and south coast herring catches, 1961 was ex-

Iceland (Contd.):

pected to show up as a most exceptionally good fishing year for Iceland. Estimates place the total 1961 catch at about 100,000 metric tons more than the 1960 catch of 513,744 tons.

The share of the trawlers in this catch, as compared with that of the motor fishing vessels, was expected to be even less in 1961 than in 1960. According to statistics from the Fisheries Association of Iceland, the trawler catch was 58,449 tons by the end of September 1961 as compared with 85,647 tons at the end of September 1960. The further pushing seaward on March 11, 1961, of the areas protected from trawling operations by the Icelandic Government by inclusion of certain base line areas obviously further tipped the scales in favor of the Icelandic motor fishing boats, which are permitted to fish within the 12-mile and base line areas.

The very exceptional herring catch last summer off the north coast of Iceland was followed by what appears to be an equally record-breaking catch for the south coast. By December 15, 1961, the south coast herring catch was twice as great as that at the same time in 1960, and amounted to 380,257 full barrels of herring, or about 38,000 metric tons, compared with 19,000 tons landed by the same time in 1960. The herring catch during October and November 1961 was reported to have been an all-time record herring catch for Iceland for those two months. Excellent fishing conditions continued to prevail during the first three weeks of December.



Barrels of herring being readied for shipment.

The herring contracts abroad had not been filled as of late December 1961. This was partly due to the rather low fat content of the catch as a whole. About 80,000 barrels of herring had been salted as of December 15, 1961, compared with 33,000 barrels at the same time in 1960. An effort was being made to marinate some 20,000 barrels of herring, which should add considerably to the total value of the catch. A feature of some importance in 1961 was the fresh-freezing of a sizable part of the south coast herring catch. Five trawler loads were landed at German ports the first part of December.

The latest contract for south coast salted herring sales was signed on December 8, 1961. This provided for 40,000 barrels of herring to be delivered to the Soviet Union, making the Soviet contract one for delivery of 80,000 barrels of herring, all of which must be of at least 15-percent fat content. As of the end of December 1961, total foreign salted herring contracts were for 125,000 barrels. The Herring Production Board has also contracted to deliver 20,000 barrels of south coast herring to West Germany and 20,000 barrels to Poland. The remaining 5,000 barrels consist largely of fully processed herring for the United States market, and low-fat content herring for the East German market. The Herring Production Board is attempting to conclude further contracts with the

United States, Rumania, and East Germany. (United States Embassy, Reykjavik, December 27, 1961.)

* * * * *

PRODUCTION OF PROCESSED FISHERY PRODUCTS AND BYPRODUCTS, JANUARY-SEPTEMBER 1961:

Product	Value		
	1,000 Metric Tons	Million Kronur	US\$ 1,000
Frozen:			
Fillets	39.3	656.4	15,265
Fish waste	8.9	15.9	370
Herring	8.4	60.1	1,165
Fish roe	0.7	10.1	235
Shrimp and lobster ..	0.2	20.0	465
Total Frozen ..	57.5	752.5	17,500
Cured:			
Salt fish, dried ...	4.0	79.9	1,858
Salt fish, wet	25.0	255.6	5,944
Stockfish	7.2	185.7	4,319
Herring, salted ...	40.8	343.7	7,993
Fish roe	0.4	3.3	77
Other	1.0	8.3	193
Total Cured ..	78.4	876.5	20,384
Canned:			
Shrimp	1/	4.6	107
Byproducts:			
Meal:			
Herring	35.6	191.6	4,456
Ocean perch	4.4	21.8	507
Lobster	0.2	0.2	5
Liver	0.3	1.5	35
Other	16.7	88.4	2,056
Oil:			
Ocean perch	1.0	4.8	112
Herring	35.0	174.9	4,067
Cod-liver	5.9	35.3	821
Solubles (50% solids)	2.9	5.3	123
Total Byproducts	102.0	523.8	12,182
Miscellaneous:			
Whale products ...	5.5	35.7	830
Trimnings	0.1	1.3	30
Total Misc. ..	5.6	37.0	860
Grand Total ..	243.5	2,194.4	51,033
Fish landed abroad	24.1	112.6	2,618
Home consumption	12.8	33.7	784
1/ Includes 60 tons of shrimp.			
Note: Values converted at rate of 43 kronur equal US\$1.00.			

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UTILIZATION OF FISHERY LANDINGS:

January-August 1961: Landings of fish and shellfish in January-August 1961 were substantially higher than in the same period of 1961.

Iceland (Contd.):

Table 1 - Iceland's Fishery Landings, January-August, 1960-1961

How Utilized	January-August	
	1961	1960
.. (Metric Tons) ..		
Herring^{1/} for:		
Oil and meal	179,779	87,923
Freezing	10,204	1,944
Salting	54,498	17,266
Fresh on ice	4,119	645
Groundfish^{2/} for:		
Fresh on ice landed abroad	16,960	12,727
Freezing and filleting	118,049	159,693
Salting	63,545	66,585
Stockfish	42,495	50,641
Home consumption	5,595	5,771
Oil and meal	2,998	4,401
Shellfish for:		
Freezing: Lobster	1,410	1,621
Shrimp	304	-
Canning (shrimp)	126	-
Total production	500,082	409,217
1/Whole fish.		
2/Drawn fish.		

January-September 1961: Increased landings of herring were mostly responsible for the increase in landings from 1960 to 1961.

Table 2 - Iceland's Fishery Landings, January-September, 1960-1961

How Utilized	January-September	
	1961	1960
.. (Metric Tons) ..		
Herring^{1/} for:		
Oil and meal	180,767	90,809
Freezing	10,730	2,352
Salting	55,075	17,278
Fresh on ice	4,119	645
Canning	114	-
Groundfish^{2/} for:		
Fresh on ice landed abroad	19,994	15,591
Freezing and filleting	125,506	169,111
Salting	64,532	68,244
Stockfish	43,028	51,359
Home consumption	6,201	6,423
Oil and meal	3,227	4,847
Shellfish for:		
Freezing: Lobster	1,488	1,819
Shrimp	747	-
Canning (shrimp)	243	-
Total production	515,771	428,478
1/Whole fish.		
2/Drawn fish.		



India

INDO-NORWEGIAN FISHERIES DEVELOPMENT PROJECT:

A tripartite agreement was signed in New Delhi on November 27, 1961, between the United Nations, the Government of Norway, and the Government of India to modify and expand the scope of the existing fisheries development project, confined to the state of

Kerala prior to the new agreement. Extension of the Indo-Norwegian fisheries project to cover other maritime states in India is the principal feature of the new agreement.

According to press reports, the Norwegian India Foundation has agreed to contribute Rs. 6.74 million (US\$1.4 million) towards completion of the remaining capital investments under the existing project and Rs. 3.32 million (\$0.7 million) a year for financing the activities envisaged in the new agreement.

The first Indo-Norwegian project, relating to fisheries development in Kerala State, has been in operation now for more than five years based on a tripartite agreement between the United Nations, the Government of Norway, and the Government of India signed in October 1956. The project was formulated with a view to raising the standard of living of the fishermen in the area through higher returns for their work, efficient distribution of fresh fish, improvement of fish products, and improvement of health of the fishing population. The contribution of the Norwegian Government has been in the form of financial and technical assistance viz., equipment, machinery, experts, and fellowships. From its inception through March 31, 1960, the progressive Norwegian expenditure on the project totaled approximately 21.9 million rupees (\$4.6 million). The entire aid has been channeled through the United Nations.

The present agreement is in the nature of an extension pact of the original project. According to available information, the fisheries development work will first be extended to the states of Mysore and Madras because of their contiguity with Kerala and similarity of fishing operations. It is also proposed to establish a new fisheries station at Cochin under the expanded project to conduct marine research and experimental fishing along the sea coast. The Cochin Station will train personnel in fishing operations, manufacture and maintenance of fishing gear, fish processing, and marketing. (United States Embassy, New Delhi, December 12, 1961.)



Israel

JOINT JAPANESE-ISRAELI FISHING COMPANY PLANNED:

A Japanese fishing company is reportedly planning to form a joint Japanese-Israeli fish-

Israel (Contd.):

ing company in Israel this year. Early in 1961 the Japanese firm conducted experimental tuna fishing off the coast of West Africa. Having obtained fairly good results, the firm decided to proceed with arrangements to establish a joint fishing company in Israel. Under this plan, Japan and Israel would each contribute 50 percent towards the establishment of the joint fishing company, which would engage in the production of tuna and fish meal.

Negotiations for this joint venture are currently in progress. However, various conjectures are being made as to whether the Japanese Government would approve this plan since other Japanese fishing companies are already undertaking the establishment of fishing bases on the West African coast. (Shin Suisan Shimbun Sokuho, December 19, 1961.)

Editor's Note: One large Japanese fishing firm has a base in Las Palmas, Canary Islands, and is constructing another at Monrovia, Liberia. Another firm is reported to be constructing cold-storage facilities in Tema, Ghana, and a third firm has a 14,000-ton fish meal factoryship operating in Angolan waters.



Italy

IMPORT LIMIT PLANNED FOR JAPANESE FROZEN TUNA:

Italy plans to limit frozen tuna imports from Japan to 14,000 metric tons a year, according to informed Japanese exporters. Reportedly, Italy hopes to import frozen tuna from other European countries and plans to control imports from Japan by taxing Japanese imports exceeding 14,000 tons. Italy had earlier agreed to admit Japanese frozen tuna free of duty until 1970, and so the Japanese exporters consider this most recent Italian plan as being separate from the earlier agreement made by Italy.

While the foregoing plan purportedly contemplated by Italy appears to be aimed at restricting imports of Japanese tuna, Japanese observers do not feel that it will ever seriously affect Japanese exports, since so far there is no visible evidence of a move to

restrict Italian imports of Japanese frozen tuna. (Shin Suisan Shimbun Sokuho, December 14, 1961.)

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COMMERCIAL FISHERIES INDUSTRY:

Italy's commercial marine fisheries industry is based principally at three large ports: Trapani for Sicily and the Mediterranean, Leghorn for the North and Atlantic fisheries, and Ancona for the Adriatic and Ionian Seas. Milan, the river port, is the center for fresh-water fisheries.

But the commercial fisheries industry also operates from these smaller centers: In the Tyrrhenian Sea there are the ports of Sardinia, Liguria, Tuscany, Latium, Campania, Calabria, Messina, and Palermo. The ports situated on the Adriatic are Brindisi, Bari, Malfetta, Manfredonia, Trani, Le Pugli. Finally, there are the ports of Abruzzi, Marche, Emilia, Venetia, Monfalcone, and Trieste.

Italian fishery catches and landings are not sufficient for the domestic demand and the needs of canneries. The country imports fishery products from Netherlands, Iceland, Norway, Spain, and Portugal. When Italy used to be a colonial power, its fisheries were developing along the coasts of Libya, Abyssinia, and the Red Sea. But since World War II Italy remains confined to the Mediterranean.

Tunisia is constantly interfering with fishing operations by seizing Italian boats along the Sicilian coasts. Yugoslavia does the same along the Adriatic coasts.

Motorized trawlers go as far as the Atlantic. The trips of these trawlers last three months on the average. Operating costs are barely covered in spite of increasing fish prices, which in Italy are higher than in all of the neighboring countries. (France Pêche, October 1961.)



Japan

UNITED STATES TUNA MARKET SURVEYED BY JAPANESE FISHERY AGENCY:

In accordance with Japan's Agriculture and Forestry Minister Kono's plan to increase

Japan (Contd.):

tuna exports to the United States, the Fishery Agency undertook a survey of United States fish market trends in November 1961 and was expected to present its findings to the Minister. The Fishery Agency's studies included: (1) fish consumption and fish supply trends in the United States; (2) growth of tuna market demand in the United States; and (3) Japan's tuna production potential to meet tuna demand in the United States. The Agency is said to be considering two alternatives for increasing Japanese tuna production to meet possible increases in tuna exports to the United States: (1) enlarging the 100-ton class vessels (which are considered uneconomical) and permit them to engage in distant-water fishing; and (2) expanding the scope of activities of the coastal fishery to embrace tuna fishing. (Shin Suisan Shimbun Sokuho, December 2, 1961.)

TUNA EXPORTERS SEEK 100 PERCENT LETTER OF CREDIT:

The Japanese Atlantic Tuna Committee has tentatively adopted a 100-percent letter of credit plan to cover exports of frozen tuna to the United States, and plans to negotiate this matter with the United States buyers. United States frozen tuna importers are reported to be opposed to this plan.

Presently, letter of credits issued to Japanese tuna exporters guarantee payments up to 95 percent of the total export price, with 5 percent being withheld to allow for claims against green meat tuna. (Shin Suisan Shimbun Sokuho, November 25, 1961.)

PROPOSED FREIGHT RATE REDUCTION FOR FROZEN TUNA SHIPMENTS TO U.S.:

The Japanese Frozen Foods Exporters Association is carefully studying the Japan Freight Conference's offer to reduce freight rates on frozen tuna shipped to the United States from \$55 to \$50 a short ton. In effecting this reduction, the Freight Conference asks that the Association revert to the use of scheduled freighters for shipping frozen tuna to the United States. By this move, the Conference hopes to win back some of the freight transportation business it lost to trampers (non-scheduled freighters), which today handle approximately 54,000 tons of

approximately 100,000 short tons of frozen tuna annually exported to the United States. While favoring the freight rate reduction, the Association does not intend to give the Freight Conference assurance that trampers would not be used. Four large Japanese fishery firms, which ship much of their cargo by trampers, do not seem to particularly welcome the freight rate reduction offered by the Conference.

Some United States packers are reported to have asked the Association to cooperate with the Conference as soon as possible, since this reduction will affect the price paid for frozen tuna. (Shin Suisan Shimbun Sokuho, December 15, 1961.)

ATLANTIC OCEAN FROZEN TUNA EXPORT PRICES:

The Atlantic Ocean Tuna Committee of the Japan Frozen Foods Exporters Association held a meeting on November 21, 1961, to study tuna price revisions and adopted the following prices f.o.b. West Africa for Atlantic Ocean tuna to be exported to the United States in December 1961: albacore \$350 a short ton, yellowfin gilled and gutted \$270 a ton, and dressed yellowfin \$280 a ton.

The Committee also set the export price of frozen tuna f.o.b. Cristobal, Panama Canal Zone, at \$10 per short ton below that of frozen tuna exported to the United States from Japan proper.

At a meeting held on December 1, the Atlantic Ocean Tuna Committee recommended the establishment of the following new floor prices (f.o.b.) for frozen tuna exported to Europe between January and March 1962:

	Yellowfin-Albacore-Bluefin		Big-Eyed	
	Jan.-Mar. 1962	Current Price	Jan.-Mar. 1962	Current Price
Exports to:	(Per Metric Ton)			
Italy & Czechoslovakia	\$310	\$290	\$280	\$275
Yugoslavia,				
Tunisia, & Libya	320	300	290	285

The present system of price classification, one for big-eyed and one for yellowfin tuna, is to be continued, with albacore and bluefin placed under the yellowfin classification. Lots of mixed fish containing more than 50 percent big-eyed tuna shall be sold under the big-eyed price; those containing less than 50 percent big-eyed will be sold under the yellowfin price classification. (Shin Suisan Shimbun Sokuho, November 24 and December 5, 1961.)

Translator's Note: As of December 8, 1961, yellowfin, albacore, and bluefin tuna exported to Europe were reported to be selling for around \$340 a metric ton (f.o.b.)

CANNED TUNA EXPORTERS REJECT PACKERS' PROPOSAL TO RAISE PRICES:

The Japan Export Frozen Tuna Producers Association informed the Japan Canned Foods

Japan (Contd.):

Exporters Association of its desire to increase the prices of canned tuna in brine for export to the United States. The increase requested was 50 cents a case above the current prices of \$9.65 per case (7-oz. 48's) f.o.b. Japan for canned white meat tuna, and \$7.60 per case (7-oz. 48's) f.o.b. Japan for canned light meat tuna. The Producers Association proposed to apply the new prices on 125,000 cases each of canned white and light meat tuna scheduled for sale around December 10, 1961.

The Canned Foods Exporters Association held a meeting on December 5, 1961, at which time it rejected the packers' proposal to raise the export prices of canned tuna in brine. (Suisan Tsushin, December 1; Suisan Keizai Shimbun, December 7, 1961.)

CANNED TUNA IN BRINE EXPORT PRICES RAISED:

Japanese prices of canned tuna in brine for export to the United States were raised for December 1961 sales. Canned white meat No. 1/2 (48 7-oz. cans a case) was raised \$0.30 per case to \$9.95 per case f.o.b. Japan, while prices on all other sizes of canned white meat tuna were raised \$0.25 per case. Canned light meat tuna was raised \$0.10 per case for all can sizes. This now brings the price of light meat tuna No. 1/2 (48 7-oz. cans a case) to \$7.70 a case f.o.b. Japan.

A total of 230,000 cases of canned tuna--130,000 cases of white meat tuna and 100,000 cases of light meat tuna--were expected to be offered for the December sales. (Suisan Tsushin, December 15, 1961.)

CANNED TUNA IN BRINE EXPORTS TO UNITED STATES:

According to official information received by the Japan Canned Foods Exporters Association, canned tuna in brine imported into the United States on and after December 15, 1961, has been taxed at the higher tariff rate of 25 percent ad valorem. However, the Association reportedly continued to export canned tuna to the United States, even at the higher tariff rate. The Association expected to continue canned tuna exports to the United States under the higher tariff rate until the

quantity exported reached 50,000 cases in December 1961. (Suisan Tsushin, December 20, 1961.)

EXPORTS OF CANNED TUNA SPECIALTY PRODUCTS:

Sales of canned tuna specialty products (known as "tender tuna"), which a Japanese firm began to export in February 1961, have totaled about 30,000 cases as of early December 1961. Sales were made to West Germany, Australia, Southeast Asia, and Okinawa.

Exports to West Germany averaged approximately 3,000 cases (Japanese flat No. 2 cans) per month, and West Germany is reported to be reselling the Japanese products to other European countries. Exports to other countries consisted mainly of Japanese flat No. 3 cans. The Japanese firm plans to produce between 300,000 and 350,000 cases of canned "tender tuna" in 1962 and hopes to export to West Germany an average of 6,000 cases per month, or about 72,000 cases in 1962.

Initially, exports of canned "tender tuna" consisted mainly of tuna packed in tomato sauce or tuna seasoned with curry, but other varieties of canned "tender tuna" have been exported, including large quantities of "tender tuna" packed in oil and seasoned with soy sauce.

Another canner, which has been packing curry tuna, vegetable tuna, and sandwich tuna since June 1961 has sold some 70,000 cases of those products. These sales were not as high as expected and the reason is the retail price of ¥65 (18 U.S. cents) a "half" can was considered too high. The firm is planning to pack in "quarter" cans in 1962. The firm plans to pack a total of 150,000 cases of one brand of the specialties in 1962. (Suisan Tsushin, December 12, 1961.)

Note: See Commercial Fisheries Review, April 1961 p. 66, and February 1961 p. 52.

NEW CANNED TUNA EXPORT REGULATIONS ANNOUNCED:

On December 1, 1961, the Japanese Ministry of International Trade and Industry (MITI) announced the following new regulations governing exports of canned tuna to the United States, which will be in effect from December 1, 1961, through November 30, 1962.

Japan (Contd.):

I- Limits on variety: Canned tuna exports to the United States shall be limited to the following varieties: canned tuna in brine; tuna spread; pet food.

II- Authorized quantity for export: The total export quota for canned tuna in brine shall be fixed and the allocation of the quota to exporters shall be computed as follows:

A- Export quotas shall be allocated on the basis of actual quantities of canned tuna in brine and canned tuna in oil exported to the United States during the period January 1, 1950, through December 31, 1955. In allocating quotas, quantities of less than 10 cases shall be counted as 10 cases.

B- Exporters receiving allocations of less than 1,000 cases under the above method of calculation shall be assigned the following adjusted quotas: (1) exporters allotted between 10 and 300 cases shall be allocated 500 cases; (2) exporters allotted between 300 and 500 cases shall be allocated 800 cases; and (3) exporters allotted between 500 and 990 cases shall be allocated 1,000 cases.

III- Supplementary documents: Exporters applying for approval to export canned tuna in brine to the United States must submit either one of the following two documents with their applications:

A- Export certificate issued by the Japan Canned Foods Exporters Association showing quantity of export.

B- Documentary proof of sales contract concluded with the Tokyo Canned Tuna Sales Company, Ltd. For members of the Japan Canned Foods Exporters Association, documentary proof of sales contract concluded with the Tokyo Canned Tuna Sales Company may be substituted in lieu of the Exporters Association's export certificate until such time that the Association's "Regulation on quantities of canned tuna to be exported to the United States" are released. Export quotas covered in the Association's regulation shall be based on can size No. 2 48's (U.S. No. 3 7-oz. 48's) as the standard case. Conversion rates for canned tuna of other sizes shall be as follows:

Japanese Can and Case Size	Equivalent U.S. Can and Case Size	Conversion Factor
Tuna No. 1 can, 24's	13-oz. 24's	0.94
Tuna No. 3 can, 48's	3-1/4-oz. 48's	0.48
Tuna 2-kg. cans, 6's	4-lb. 6's	1.16

IV- Tuna spread and pet food: Exporters applying for approval to export tuna spread and pet food to the United States must submit the following documents:

A- Tuna spread - Certificate of inspection issued by the Canned Foods Inspection Association.

B- Pet food - Certificate of inspection issued by the Ministry of Agriculture and Forestry.

V- Country of destination: The term "United States" as used in the regulation refers to the United States of America, District of Columbia, Puerto Rico, Virgin Islands, Panama Canal Zone, Guam Island, Samoa, Wake Island, Midway Island, Canton and Enderbury Islands (Phoenix Islands group), and St. Thomas Island.

VI- Export performance report: With the exception of members of the Canned Foods Exporters Association, all exporters applying for approval to export canned tuna in brine to the United States must submit to MITI by December 12, 1961, export licenses (customs clearance forms) covering the period January 1, 1950, through December 31, 1955, for certification of their export records. (Suisan Keizai Shimbun, December 2, 1961.)

EXPORT TO U. S. OF CANNED TUNA PACKED BY MALAYAN-JAPANESE CANNERY APPROVED:

The Japanese Fisheries Agency in December 1961 was reported to have approved the application to export canned tuna in brine to the United States submitted by the overseas company, acting as sales agent for the jointly-operated Malayan-Japanese tuna company located in Penang, Malaya. The Malayan cannery reportedly is facing a financial crisis and the Fisheries Agency, rather than permit that company to fail, has approved its export application but has indicated that the quantity for export would be less than the 46,000 cases requested by that company. Opinion is that the Agency will likely set that company's export quota at 30,000 odd cases.

The Malayan cannery was packing only canned tuna in oil for export to Europe. Its production of canned tuna in oil was 18,020 cases (48 No. 1/2 or 7-oz. cans) July-December 1960, 44,000 cases January-July 1961, and an estimated 35,000 cases July-December 1961.

The Fishery Agency's approval of the Malayan firm's application to export canned tuna in brine to the United States marks a significant departure from established policy. In the past, Japanese overseas fishing establishments have been prohibited from exporting their canned products directly to the United States. Also, in this same vein, exports of Japanese frozen tuna to foreign countries which would likely export canned tuna products to the United States, and thereby compete directly with Japanese canned tuna exports to the United States, have been prohibited.

Considerable speculation is going on in Japan as to measures the Fisheries Agency may adopt in handling future requests to establish canning facilities abroad and to export canned tuna produced at these overseas bases to the United States. Firms with bases in New Hebrides, North Borneo, Argentina, and Brazil, are reported to be equipped to immediately undertake such an operation. Also, the Fisheries Agency is now expected to have a more difficult time in refusing requests from such countries like Spain to import tuna caught by Japanese vessels operating in the Atlantic Ocean. Such requests until now have been refused since those countries would be competing directly with Japan for the United States canned tuna market.

The initial establishment of the Malayan-Japanese tuna firm had been strongly opposed by the Japanese tuna canning industry on the grounds that it would not be possible for that company to make a go of it merely by packing canned tuna in oil for export to Europe, and that eventually that company would seek to export its products to the United States. Despite this strong opposition from the canning industry, the Fisheries Agency and the parent of the Malayan firm established the joint Malayan-Japanese firm in Penang. (Suisan Tsushin, December 21 & 25, 1961.)

WINTER ALBACORE TUNA FISHERY UNDER WAY:

Japanese fishing for winter albacore was concentrated as of mid-December 1961 around 38° N. latitude, east of Kinkazan, Miyagi Prefecture, replacing good mackerel-pike fishing and the prolonged skipjack tuna fishing season in that area.

The Sumiyoshi Maru No. 18 (145 tons) of Tokushima Prefecture landed its final mackerel-pike catch in Shioyama around mid-December and was making preparations for win-

Japan (Contd.):

ter albacore fishing, loading bait and other necessary materials. It was expected to sail for the above fishing ground with a number of vessels from Shizuoka and Mie Prefectures. Winter albacore fishing was expected to be in full swing when the vessels arrived on the fishing ground. (Suisan Keizai Shimbun, December 16, 1961.)

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YAIZU FISHERY LANDINGS,
NOVEMBER 1961:

A total of 8,875 metric tons of fish were landed at Yaizu, leading Japanese tuna fishing port, during November 1961. (Suisan Keizai Shimbun, December 9, 1961.)

Yaizu Fishery Landings, Principal Species, November 1961			
Species	Landings	Ex-Vessel Value	Average Price
	Metric Tons	US\$	US\$/Metric Ton
Bluefin	5,546	1,483,755	\$268
Albacore	344	134,086	390
Skipjack	1,588	312,119	197
Mackerel	139	26,386	190

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FORECAST FOR TUNA FISHING
IN EASTERN PACIFIC:

The Kanagawa Prefecture Fisheries Experimental Station in Japan released in mid-December 1961 its forecast of tuna fishing in January 1962 for the eastern Pacific. The estimate was given on the basis of metric tons per 800 hooks.

Second Fishing Area (5°-20° N. latitude, east of 150° W. longitude): Over the entire sea area west of 110° W. longitude, from 5°-13° N. latitude, the black marlin catch was expected to be 0.42 ton. The big-eyed catch east of 130° W. longitude was forecast at 5 tons, while west of that line it was expected to be only 0.8 ton. Also, the yellowfin catch east of 130° W. longitude was expected to be higher than west of that line at 0.5 ton in the east and 0.2 ton in the west.

Third Fishing Area (5° N. latitude-10° S. latitude, east of 150° W. longitude): A good period for big-eyed fishing was expected in the area from the equator to 5° S. latitude, an increase in catch in the area between 5° and 7° S. latitude, and an end of good fishing in the area between 7° and 10° S. latitude. In both of the first two areas the rate of catch

was expected to be about 5 tons, and 4.2 tons for big-eyed around 110° W. longitude. Yellowfin were expected to move northward from around 10° S. latitude gradually to 4° S. latitude and the catch rate was expected to be 2.6 tons. The black marlin catch was expected to vary from area to area but generally a rate of 0.4 ton was expected.

Fourth Fishing Area (10°-30° S. latitude, east of 150° W. longitude): In the sea area east of the Pomotsu Islands 18°-23° S. latitude, albacore catch rate was to be comparatively high at about 1.8 tons. The catch rate should be some 1.4 tons for black marlin in the area around those islands. Also, the area at 120° W. longitude with a catch rate of 4 tons is an extension of the third fishing area in the Eastern Pacific. (Japanese periodical, December 18, 1961.)

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TUNA MOTHERSHIP CATCH
IN SOUTH PACIFIC AREA:

A Japanese fishing company's tuna mothership Jinyo Maru (7,161 gross tons), which operated in the South Pacific Ocean, was scheduled to return to Tokyo on November 27, 1961. This mothership, which was accompanied by 40 catcher vessels, is reported to have caught a season total of 3,200 metric tons of fish, of which albacore tuna made up 36 percent (1,152 metric tons) and yellowfin tuna 28 percent (896 metric tons). (Hokkai Suisan, November 20, 1961.)

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SOUTH PACIFIC TUNA OPERATIONS:

The Japanese tuna mothership No. 3 Tenyo Maru operating in the South Pacific Ocean was reported to have caught 771 metric tons of albacore and 130 metric tons of yellowfin tuna, and 495 metric tons of spearfish, as of December 20, 1961. (Suisan Keizai Shimbun, December 24, 1961.)

The Japanese tuna long-line vessel Choko Maru (159 gross tons) was reported in mid-December 1961 to be returning to its home port at Kesennuma in northern Japan with a load of fish taken from the waters east of Australia. The Choko Maru, which operated in the area bounded by 150° to 157° E. longitude and 14° to 24° S. latitude, caught a total of 80.6 short tons of fish taken in 31 sets, primarily albacore, followed by spearfish

Japan (Contd.):

and yellowfin tuna. (Suisan Keizai Shimbun, December 20, 1961.)

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DISTRIBUTION OF TUNA IN THE PACIFIC OCEAN:

A lecture on the distribution of tuna in the Pacific Ocean was given by the Director of the Nankai-ku Fisheries Research Institute in Magasaki, Kyushu, under the sponsorship of the Fisheries Section, Nagasaki Municipality.

The substance of this lecture was that the distribution of tuna in the Pacific Ocean is a belt-like area stretching from east to west centered around the equator. The higher the latitude, the less the fish schools are distributed. Each tuna species, however, lives in a certain section of the belt, different from others. There are known to be about 13 sections.

Tuna migration may be classified into two types; one under the same living conditions and the other caused by a change of living conditions which usually takes place in March and September of each year.

Spawning occurs in a wide area for a considerable length of time and the number of eggs from one fish is more than one million. Striped marlin spawn in comparatively high latitude areas.

Japanese waters are not particularly favorable to tuna, but the living conditions of tuna (including seasonal conditions) are fairly well known and planned production can be carried out.

In the Pacific, the more easterly a section is located, the larger the size of fish found in that section. The thickness of the schools remains the same throughout the year and fishermen can build vessels based on their judgment of the species in which they are primarily interested and their ability to swim. (Suisan Keizai Shimbun, November 17, 1961, and other periodicals.)

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TROPICAL ATLANTIC TUNA FISHING IMPROVES:

According to Japanese reports coming from the fishing areas, albacore tuna fishing

by Japanese vessels off Recife, Brazil, began to improve in September 1961. November-December 1961 yellowfin and albacore tuna fishing off Africa also entered the seasonal peak. But fishing was not yet completely satisfactory because the average catch per day for a 400-ton long-line vessel was 8-9 metric tons, which is the same as in 1960. Seasonal peak fishing was expected to last until January 1962 and much was expected of future fishing.

Export demand for frozen tuna from Atlantic production has held steady since June and July 1961. In fact, the available supply was considered inadequate. For this reason, Atlantic tuna was selling at the export price of around US\$300 per metric ton c.i.f.

Mid-December 1961 export prices for Atlantic frozen tuna were \$310 a metric ton for Italy, \$320 a ton for Yugoslavia and Tunisia, and \$340-\$350 a short ton for albacore transshipped to the United States. These prices were substantially higher than \$260 for Europe and \$310 for transshipment to the United States reported for the same period in 1960. Compared with the same period in 1960, total exports of frozen Atlantic tuna April-November 1961 increased 10 percent in quantity and about 20 percent in value.

Reflecting the gradual rise in frozen Atlantic tuna prices in the United States, tuna shipped directly from Japanese ports as of mid-December 1961 was priced \$70-\$80 a short ton higher than in 1960. The tuna catch in the Pacific towards the last part of 1961 was showing the same tendency as Atlantic tuna when compared with 1960. For frozen Pacific tuna as of mid-December 1961, prices were \$390 per short ton f.o.b. for albacore and \$340-\$350 for yellowfin shipped directly from Japan. The prices were \$310 on albacore and \$270 on yellowfin in the same period of 1960. (Suisan Keizai Shimbun, December 18, 1961.)

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TUNA FISHING IN THE ATLANTIC OCEAN SLOW IN 1961:

Japanese tuna fishing in the Atlantic Ocean was reported slow during 1961. Late in December 1961, a total of 52 Japanese tuna vessels were operating in the Atlantic Ocean. About 40 of those were concentrated in the albacore fishing area off the coast of South America. While the catch increased somewhat early in December 1961, fishing was still

Japan (Contd.):

generally slow compared with the same period of 1960.

Yellowfin and big-eyed tuna catches off the coast of West Africa were reported as very light, with yellowfin making up from 20 to 40 percent of the daily landings.

The number of tuna vessels operating in the Atlantic Ocean during 1961 was 10 less than in 1960. However, 6 vessels are scheduled to be added to the tuna fleet in 1962, which will bring the Atlantic Ocean tuna fleet up to 58. (Suisan Tsushin, December 20, 1961.)

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JAPANESE HOPE TO ESTABLISH FROZEN TUNA WAREHOUSE IN ATLANTIC AREA:

At the Government-Industry meeting of the Japanese Export Trade Promotion Council held in early November 1961, the Japanese frozen tuna industry submitted a proposal to establish a warehouse (cold-storage cooperative) at Ghana, West Africa, which would be used to regulate the flow of frozen tuna in the Atlantic Ocean area to stabilize market conditions.

This proposal is not new and was originally made in May 1961. At that time, the catch of Atlantic Ocean tuna had been expected to surpass the 1960 high catch. To prevent a disruption in the European tuna market, as had happened in the past, tuna vessel operators had urged the establishment of a warehouse in the Atlantic, and some fishing companies strongly urged that they be permitted to use the fishing base being built at Monrovia, Liberia, by a large Japanese fishing company. The catch in 1961 fell way below expectations and interest in the warehouse plan died down.

Specifically, the tuna industry wants to establish a warehouse to: (1) separate catches according to countries of destination; (2) carry out quality control whereby rejected fish would be shipped back to Japan; (3) regulate the flow of tuna to control market prices. Eventually, fish canning and fish ham-sausage manufacturing plants would be established at the warehouse site. The warehouse center would operate as a multiple enterprise and handle the catch of the Japanese Atlantic

trawl fleet as well. The tuna industry wants the Japanese Government to finance this project. However, Government authorities are insisting that before this plan can be implemented, the tuna industry should submit a concrete detailed proposal.

As far as the joint use of the large Japanese fishing company's base at Monrovia is concerned, the firm reportedly has no objection to other Japanese fishing firms utilizing its fishing base, which is expected to be completed in mid-1962. This base, which is being jointly financed by the large Japanese firm and the Nigerian Government, will have a 2,000-ton capacity cold-storage plant. (Suisan Keizai Shimbun, November 22, 1961.)

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STUDIES ON DISCOVERING "GREEN MEAT" TUNA ABOARD THE VESSEL:

The Japanese have been studying means of determining aboard the vessel what type of tuna will show up as "green meat" tuna after it is processed for canning.

For yellowfin, the studies reveal that it is impossible to tell whether green meat is related to the color of meat before processing aboard the vessel. Fish weighing 66-88 pounds were found to be free from the occurrence of green tuna. There was no connection between occurrence of green tuna and area of capture for that size fish. Fish weighing more than 111 pounds and some of that size caught in the Caribbean Sea were found to include fish with green meat. Whether or not the tuna processed for canning is fresh or frozen does not seem to make any difference as far as the occurrence of green meat is concerned.

For albacore, generally speaking, fish weighing around 44 pounds were free from green tuna but that was not true of the smaller fish. No green meat developed in the albacore caught in the Caribbean Sea, but unless handled properly it was learned that dark-colored meat might develop. Fish caught near 40° north and south latitudes were quite variable in quality and color.

Generally speaking, green meat developed in big-eyed tuna. For Australian tuna, most medium fish developed a meat of dark color, but since the quantity studied was small it was difficult to draw any conclusions. (Suisan Keizai Shimbun, December 6, 1961.)

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Japan (Contd.):

CANNED TUNA PACK, 1960:

Of the almost 6.0 million standard cases of tuna products canned in Japan, almost 3.3 million cases were tuna canned in brine or oil, and the balance was specialty tuna prod-

Japanese Pack of Canned Tuna, 1960	
Product	Std. Cases (48 7-oz. Cans)
Tuna (other than skipjack) in brine	1,643,188
" " " " in oil	410,991
Skipjack in brine	473,501
" " " " in oil	761,375
Total in brine or oil	3,289,055
Tuna (other than skipjack), seasoned	378,223
" " " " flake	1,137,109
" " " " cooked with vegetables	43,311
" " " " in jelly	34,635
" " " " in seasoning	55,544
" " " " in tomato sauce	60,892
" " " " stewed	39,466
" " " " cooked with curry	65,440
" " " " cooked with soy sauce	18,872
Tuna, other products	1,342
Skipjack, seasoned	175,595
" " " " flake	360,168
" " " " in jelly	42,302
" " " " broiled	2
" " " " cooked with vegetables	203,558
" " " " in tomato sauce	15
" " " " other forms	49,116
Total specialty products	2,665,590
Grand Total	5,954,645

ucts. Of the almost 3.3 million cases packed in brine or oil, 2.1 million cases were packed in brine and almost 1.2 million cases packed in oil.

Note: See Commercial Fisheries Review, December 1961 p. 73.

EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-JUNE 1961:

Exports of canned fishery products during the first six months of 1961 were somewhat

lower than those for the same period in 1960. The decline was general among most of the important products, including canned tuna, crab meat, mackerel-pike, sardines, and salmon.

CANNED MACKEREL EXPORTS AND SUPPLY, APRIL-NOVEMBER 1961:

A total of 612,000 cases of canned jack mackerel (actual number of cases) were approved for export between April and November 1961, according to data compiled by the



Fig. 1 - Miyako, Iwate Prefecture, considered Japan's leading mackerel port. Here the boats, flying colorful pennants, are assembled ready for the opening of the new mackerel season, generally in September.

Japan Export Canned Jack Mackerel Producers Association. Exports to Singapore and West Africa made up over two-thirds of the total exports. Supply of canned jack mackerel as of November 25 totaled slightly over 93,000 actual cases. (Suisan Tsushin, December 1, 1961.)

Japanese Canned Fishery Products Exports, January-June 1961 and 1960					
Product	Jan.-June 1961				Jan.-June 1960
	To U.S.	To Canada	Other Countries	Total	Total
..... (Actual Cases)					
Crab meat	44,183	1,550	62,336	108,069	127,490
Tuna:					
in oil	-	105,178	550,346	655,524	711,014
" brine	997,308	-	-	997,308	1,025,009
other types	-	4,683	74,352	79,035	40,877
Mackerel-pike	6,513	80	114,698	121,291	647,034
Sardine	350	-	121,053	121,403	385,654
Horse-mackerel	45	-	233,416	233,461	150,469
Salmon, trout	12,961	111	233,277	236,349	453,695
Other fish	3,266	313	250,580	254,159	168,180
Shellfish	160,840	33,045	36,046	229,931	188,474
Other aquatic products	2,751	113	1,341	4,205	2,643
Total	1,228,217	145,073	1,787,445	3,160,735	3,904,539

Japan (Contd.):

Table 1 - Japanese Exports of Canned Jack Mackerel, April-November 1961

Destination	No. Cases
Singapore	237,068
West Africa	178,875
Indo-China	36,265
Ceylon	34,802
New Guinea	20,309
Borneo	20,148
Middle East	11,506
Hong Kong	8,956
Other	64,160
Total	612,089

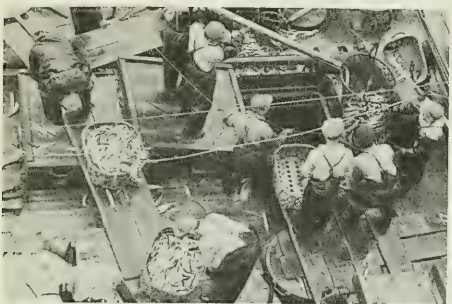


Fig. 2 - Aboard a Japanese mackerel fishing vessel fishermen are packing the fish in baskets for stowing in the hold.

Table 2 - Japanese Exports and Supply of Canned Jack Mackerel

Japanese Can Size	Equivalent U.S. Can Size	No. Cases Exported (4/1-11/25)	No. Cases on Hand (As of Nov. 25)
In tomato sauce:			
No. 1 oval	1-lb. oval 48's	107,746.5	10,928.5
No. 3 oval	½-lb. oval 96's	98,469	2,109
No. 1 small	5-oz. tall 100's	268,441	29,206.5
No. 4	1-lb. tall 48's	57,478	19,639.5
No. 6		7,326.5	25.5
Natural:			
No. 3 oval	½-lb. oval 96's	1,423.5	2,964
No. 2 flat	8-oz. oblong 48's	0	69
No. 1 small	5-oz. tall 100's	34,745	22,143
No. 4	1-lb. tall 48's	36,459	6,722
Total		612,088.5	93,807

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SARDINE INDUSTRY:

Japan's fishery for "Iwashi" (sardine, anchovy, and pilchard) is conducted practically the year-round for one or another of those species of fish.

The canning season for sardines is from August to October; anchovies, January to March; pilchards from April to July followed by a second season from October to December.

The annual case pack of sardines for the past five years is: 1956 - 6,000; 1957 - 9,000; 1958 - 12,000; 1959 - 45,000; 1960 - 18,000 cases. The drop in pack from 1959 to 1960 was caused by the short supply of fish in waters off the coast of Japan. The pack of sardines in 1961 totaled 50,000 cases.

Sardines, which include small pilchards, are packed in cottonseed oil in dingley or quarter cans. They are marketed for domestic use only. The only exports during the last five years occurred in 1956 when 1,000 cases were shipped to Hong Kong.

The 1961 "Iwashi" pack other than those packed in dingley cans was made up of large pilchards and anchovies packed in tomato sauce. Pilchard production totaled 622,300 cases of which 240,000 cases were packed in 15-ounce ovals (48 cans per case); 220,000 cases in 7½-ounce ovals (96 cans per case); 147,000 cases in 5-ounce flats (100 cans per case); 7,500 cases in 15-ounce tallis (48 cans per case); and 7,800 cases in 8-ounce oblongs (96 cans per case). The entire pack of anchovies which amounted to 4,500 cases was packed in 7½-ounce ovals (96 cans per case).

The number of cases of sardines that Japan could have produced annually for the past five years under full-scale activities is estimated at 1,000,000. This estimate is based on two important factors: (1) that the fish would have been in plentiful supply; and (2) that a strong market demand would have existed for the canned product.

The Japan Canned Sardine Cannery Association states that there are approximately 100 plants in Japan canning sardines. The average wage per worker per month is dependent on the size of the plant in which employed. In small plants (less than 30 employees) the average wage per month is US\$30. In medium size plants (30 to 99 employees) the average wage per month is \$27. In large plants (100 to 150 employees) \$25 a month.

In 1961 ex-vessel prices averaged \$69 per metric ton for pilchards and \$52 per metric ton for anchovies.

The number of sardines packed in dingley-type cans is 14 to 15. No packs of 4 to 5 or 6 to 8 count fish are made. Prices as of mid-December 1961 were: sardines (dingley cans, 100 cans per case, key or keyless) f.o.b. Japan \$35. (United States Embassy, Tokyo, Decemr 12, 1961.)

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CANNED SARDINE EXPORTS:

Japan's sardine exports for April 1, 1961, to August 31, 1961, totaled 270,520 cases. These consisted of 268,340 cases of pilchards and 2,180 cases of anchovies. Both species were packed in tomato sauce: pilchards packed in 15-ounce and 7½-ounce ovals, 5-ounce flats, 15-ounce tallis, and 8-ounce oblongs; and anchovies packed in 7½-ounce ovals.

Shipments to the Philippines totaled 117,834 cases or 43.6 percent of the total exports. Exports (in number of cases) to other areas were: Belgium, 41,432; other European countries 4,076; Middle and Near East, 1,339; West Africa, 42,097; other African countries, 5; Ceylon, 50; Burma, 15,987; Singapore and Malaya, 5,166; Hong Kong, 5,279; Indonesia, 13,674; Central and South America, 11,141; other countries 12,440.

During the Japanese fiscal year of 1960 (April 1, 1960-March 31, 1961), 463,561 cases

Japan (Contd.):

of canned sardines were exported, of which 462,613 cases were pilchards and 948 cases were anchovies. A total of 285,059 cases or 61.5 percent were consigned to the Philippines and 178,502 cases to the other countries mentioned in preceding paragraph.

There were no exports of pilchards or anchovies to the United States in 1960 or 1961. (United States Embassy, Tokyo, December 26, 1961.)

CANNING OPERATIONS OF LARGE FISHING COMPANIES EXPAND THROUGH TIE-UPS WITH SMALL PACKERS:

The large Japanese fishing firms are reportedly pushing forward plans to tie up with medium and small packing companies having daily production capacities of between 500 and 1,500 cases. They would supply the small packers with raw material on a year-round basis, which would be packed under their own brands and sold through their extensive sales network. This arrangement, which amounts to packing on a commission basis, would permit major fishing companies to increase the variety of canned food packed under their own labels, reduce brand competition, and establish new sales channels and markets for their products.

Consignment of production poses the problem of pack uniformity and quality control. This reportedly is not a problem at the present time since the production of one kind of product is consigned to only one packer.

Annual domestic consumption of all types of canned food in Japan has risen rapidly in recent years, from 10 million cases in 1955 to 30 million cases in 1957, 40 million cases in 1959, and 50 million cases in 1961. Despite this increase in canned food consumption, the small Japanese packing companies have not fared too well due to increased production cost, the seasonal nature of their operations, lack of sales outlet, and inability to conduct market research. The large fishing companies have now stepped into this picture, providing financial assistance in some cases, and have made arrangements with these small packers for them to pack on a consignment basis, making it possible for these small packers to operate on a year-round basis. This trend, which developed

two years ago, is reported to have greatly accelerated in 1961. (Nippon Suisan Shimbun, November 24, 1961.)

TRAWLING OPERATIONS OFF WEST AFRICA:

A Japanese fishing company plans to operate a trawler of 1,500 tons gross in the Atlantic Ocean off the coast of West Africa from September 1962 to March 1965. This trawler, which is being constructed to replace the company's No. 1 Seiju Maru (600 gross tons), presently operating in the Atlantic Ocean, is scheduled to be dispatched to the Atlantic Ocean after its completion in May 1962. Las Palmas, Canary Island; Genoa and Livorno in Italy; and Gibraltar have been tentatively designated as ports where this trawler can land its catches. (Shin Suisan Shimbun Sokuho, November 16, 1961.)

Translator's Note: Of the four ports mentioned above, Genoa has a cold-storage plant of 3,000-ton capacity, and Livorno and Las Palmas each have cold-storage plants of 2,000-ton capacity.

PLAN TO SURVEY EAST AFRICA FISHERIES:

The Japanese Overseas Fisheries Cooperative Society intends to carry out a fishery investigation in Kenya, Uganda, Tanganyika, and Zanzibar. The aim is to study the possibility of joint commercial fishery enterprises. A team of six members will spend about 40 days in those countries with expenses paid, in part, by the Japanese Government. (Fisheries Economic News, October 6, 1961; Suisan Tsushin, October 7, 1961; Suisan Keizai Shimbun, November 9, 1961.)

FISHERIES AGENCY PERMITS TRAWLING SOUTH OF ALASKA PENINSULA:

On December 22, 1961, the Japanese Fisheries Agency informally notified two large Japanese fishing companies of its intention of letting them operate trawl fleets south of the Alaska Peninsula this winter (principally during January, February, and March), according to Suisan Keizai Shimbun, December 23. The Agency had earlier indicated that it would likely permit the two companies to operate trawl fleets in the eastern Bering Sea this winter, and one of the firms had gone

Japan (Contd.):

ahead and readied the fleet consisting of the mothership Chichibu Maru (5,500 gross tons) and six 250-ton trawlers. All of the trawlers are fitted with steam pipes around the hull to de-ice it during winter operations. According to Hokkai Suisan of December 25, this mothership fleet was expected to depart Hakodate, Hokkaido, on December 28 and remain on the fishing grounds until March 1962. It was expected to operate in the eastern Bering Sea and in the North Pacific Ocean south of the Aleutian Islands and the Alaska Peninsula. At the invitation of the Japanese Government, a U. S. Bureau of Commercial Fisheries biologist is accompanying the fleet to observe operations and to make scientific studies.



Typical Japanese trawler fishing for bottomfish in the Bering Sea and the North Pacific.

The other fishing company was reported to be planning on sending in February 1962 the freezer ship Eiyo Maru (3,000 gross tons) to the eastern Bering Sea accompanied by one 1,500-ton trawler and two 250-ton trawlers, according to Suisan Tsushin, December 21. It is authorized to fish in the North Pacific Ocean west of 145° W. longitude and north of 50° N. latitude. A Canadian biologist was expected to accompany this fleet.

The Suisan Keizai Shimbun states that the following restrictions are being placed on the winter trawling operations:

- (1) Only mothership-type operations will be permitted. Motherships must be over 3,000 gross tons.
- (2) Use of large trawlers will be prohibited.
- (3) Halibut, salmon, king crab, and young herring must not be taken. Catch of salmon and halibut is prohibited east of 175° W.

longitude. Fishing for king crab is prohibited. When any of these species are incidentally caught, they are to be released immediately. Herring under 21 centimeters (8.3 inches) fork length shall not exceed 10 percent of total herring catch per trip.

(4) Long-line gear will be prohibited so as to prevent the taking of halibut.

(5) Operations in the Bering Sea and south of the Alaska Peninsula will be restricted to the waters east of 170° E. longitude. Area includes Bering Sea and waters of North Pacific west of 145° W. longitude and north of 50° N. latitude, exclusive of area of Tokai Maru crab operations north of Alaska peninsula.

The Japanese Government has informed the United States Government that these operations are experimental in nature. In addition, the Japanese Government has assured the United States that any salmon or halibut caught will be returned to the sea; and that Japanese Government inspectors accompanying the fleets will require them to move out of areas in which salmon or halibut are found intermingled with other species of fish.

* * * * *

NEW FREEZER FACTORYSHIP FOR EASTERN BERING SEA BOTTOMFISH FISHERY:

The newly-constructed freezer factoryship Chichibu Maru (5,500 gross tons) was delivered to a Japanese fishing company at Kobe on December 13, 1961. This factoryship was scheduled to depart for the eastern Bering Sea from Hakodate around December 28, and was to be accompanied by six new 250-ton trawlers. Chichibu Maru's specifications are as follows: total length, 133.2 meters (436.9 feet); beam, 18 meters (59 feet); draft, 7 meters (23feet); gross tonnage, 5,500 metric tons; cruising speed, 13.5 knots; maximum speed, 15.8 knots; and freezing capacity, 185 metric tons per day.

The Bering Sea forerunner of the fleet sailed on November 10, 1961, from its base at Kurihama near Yokosuka for the fishing grounds around the Pribilof Islands. The next vessel sailed on November 11. The forerunner that served as scout for the main fleet was the No. 50 Akebono Maru (1,500-ton trawler).

Japan (Contd.):

Apart from the main fleet, the No. 50 Akebono Maru was expected to engage in general exploratory work and trawling operations around the Pribilofs for some 50 days, and return to Japan late in January with an expected cargo of about 900 metric tons of pollock, rockfish, and cod. (Suisan Keizai Shimbun, December 14, 1961, and other periodicals.)

* * * * *

BERING SEA BOTTOMFISH FISHERY DEVELOPMENTS:

Eleven Japanese fishing firms which operated bottomfish fishing fleets in the Bering Sea in 1961 have formally formed the Northern Waters Bottom Fish Mothership Association.



Fig. 1 - Washing silt and dirt from catch aboard a Japanese bottomfish fishery factoryship operating in the Bering Sea. Man at right is pushing fish onto conveyor belt leading into cleaning and washing compartment.

The Bottom Fish Association will primarily serve in a liaison capacity and submit petitions to the Government on matters relating to the Northern Waters bottomfish fishery which the Association considers to be of mutual interest to its members.

In early December 1961, the Japanese Fishery Agency submitted a request to the Association that it voluntarily reduce by 30 percent in 1962 the numbers of fleets engaged in bottomfish fishing in the Bering Sea. In 1961 a total of 33 fleets operated. It was suggested to the industry that the fishing companies operating more than two fleets cut down their fleets to their 1960 level of

operations and that the remaining companies not increase their operations beyond their 1961 level. Up to 1960, bottomfish fishing in the Bering Sea was carried out by 12 fleets-- 5 fish meal factoryships, 4 fleets in the Olyn-torsk area, and 3 flounder fishing fleets.



Fig. 2 - Cleaning and packing compartment aboard a Japanese bottomfish factoryship in the Bering Sea.

The Association recognizes the necessity of reducing the number of fleets operating in the Bering Sea. It was suggested that the 1962 operations be limited to 24 fleets, a reduction of 9 fleets, but the Association members have not yet been able to agree on how to effect this reduction, and apparently have requested the Agency's assistance. The Agency was expected to announce its decision in early January 1962. (Suisan Keizai Shimbun, December 9 & 19, 1961; Nippon Suisan Shimbun, November 29, 1961.)

* * * * *

SABLEFISH FISHING IN BERING SEA:

Japanese fishing for sablefish or silver cod in northern seas to supplement poor halibut fishing the latter part of 1961 yielded a catch of 2,600 metric tons--more than expected. Some 250 tons were expected to be exported to the United States.

The export was tried for the first time in 1961 and exporting companies have made strenuous efforts to develop a market. Contracts for more than half the amount earmarked for export to the United States had been signed as of mid-November 1961.

The two companies exporting the fish have had difficulties in obtaining 7-8 pound fish in-

Japan (Contd.):

dividually frozen--the type needed for export. Most of the sablefish in northern waters, however, weigh 3-6 pounds each. Individually freezing fish aboard a Japanese mothership is not adaptable to the processing and preservation methods used. While one of the Japanese firms contracted to furnish fish weighing more than 5 pounds each in blocks of 27 pounds, the other of the two firms decided on individually freezing all its fish weighing 5 pounds each in anticipation of future sales. For both companies, sablefish exports are on a trial basis.

As the sablefish are used for smoking, the large oily fish are preferred. Fish suitable for export made up only 10 percent of the entire catch of sablefish.

The firm selling the blocks reports the price as 22 cents a pound c.&f. for fish more than 5 pounds each. The other firm's price for individually-frozen fish is 20-24 cents a pound. In addition to the two firms that are exporting fish frozen aboard their motherships, a third Japanese firm was planning to export to the United States about 100 tons of sablefish landed in Japan. A fourth firm was reported to have stopped exports of sablefish. (Suisan Keizai Shimbun, November 18, 1961.)

* * * * *

BERING SEA HERRING CATCH LIMIT CONTEMPLATED:

Some members of the Northern Waters Bottom Fish Mothership Association, composed of the 11 companies which operated fleets for bottomfish fishing in the Bering Sea in 1961, are reported to favor the estab-

lishment of catch restrictions for herring in 1962 in that area. Catch of herring in the Bering Sea in 1961 was far above expectations, totaling 72,260 metric tons, with 55,000 metric tons frozen. Supply thus far has far exceeded demand and, as of November 20, 1961, members of the Association are reported to have a total of 19,670 metric tons of frozen herring in stock, and the herring market is described as soft.

Opinions are being expressed that the catch of herring in the Bering Sea should be limited to 35,000 to 40,000 metric tons in 1962 and that the Fisheries Agency may possibly set a herring catch limit, in addition to placing a restriction on the number of fleets which will be permitted to operate in the Bering Sea in 1962. (Suisan Tsushin, December 16, 1961.)

* * * * *

BRISTOL BAY KING CRAB OPERATIONS:

The Japanese Fishery Agency announced that it will permit two king crab factoryships to operate in Bristol Bay in 1962, instead of one as in years past. Two fishing firms will be allowed to operate one factoryship and two other firms the second factoryship. The production quota for these two fleets will be 60,000 cases and 70,000 cases of canned crab meat, respectively. Previously, the Japanese operated only one king crab factoryship (Tokei Maru)--operated jointly by three fishing companies. Tokei Maru's production quota in 1961 was 80,000 cases of canned crab meat.

Two large Japanese fishing companies, which have been authorized by the Fisheries Agency to jointly operate one king crab fac-



Fig. 1 - Tokei Maru, Japanese king crab factoryship operated jointly by three fishing companies in 1961 in Bristol Bay.

Japan (Contd.):

toryship in Bristol Bay in the spring of 1962 (production quota--70,000 cases), are reported to be negotiating with another fishing company to purchase that company's king crab factoryship, Shiraneyama Maru (5,700 gross tons). The company selling the Shiraneyama Maru plans to replace it with the freighter Seiyo Maru (6,000 gross tons) which it would convert for king crab fishing in the Sea of Okhotsk. The Seiyo Maru is presently employed in transporting fish meal.

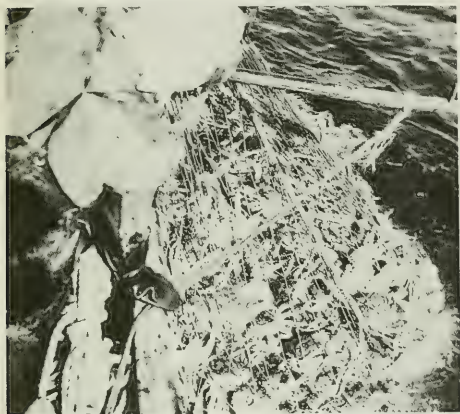


Fig. 2 - A net load of crabs being hauled aboard a Japanese crab fishing vessel.

The other two fishing companies authorized to operate in Bristol Bay are planning to jointly operate the king-crab factoryship Tokei Maru in Bristol Bay in 1962. These two companies have been allocated a quota of 60,000 cases of king crab.



Fig. 3 - A large catch of crabs on the deck of a Japanese king crab mothership.

Separate from the factoryships, one Japanese fishing company will be permitted to continue operating the king crab freezer ship Shinyo Maru (5,630 gross tons) with a new catch quota of 300 metric tons. This represents an increase in the catch quota of 100 metric tons over that previously allocated to the company operating the freezer ship.

The Fishery Agency has not yet clarified its intentions regarding 1962 fall king crab fishing. However, fall king crab fishing is expected to be curtailed to some extent due to increases in catch and production quotas granted for the 1962 spring king crab operations. In the fall of 1961, the Agency permitted three 1,500-ton freezer ships with a total catch target of 700 metric tons to operate in the eastern Bering Sea. In 1962, the Agency is expected to reduce the fall king crab catch quota by 300 tons to a total of 400 tons. (Suisan Keizai Shimbun, December 22, 1961.)

* * * * *

FISH MEAL INDUSTRY STUDY PLANNED:

Reports indicate that the Japanese Fisheries Agency has decided to undertake a study of the Japanese fish meal industry to be completed by March 1962. This decision appears to have been made following continued increases in the export price of Peruvian fish meal, of which Japan imports close to 30,000 metric tons annually.

Japan imported 28,700 metric tons of Peruvian fish meal in FY 1960 (April 1, 1960-March 31, 1961). As of mid-November 1961, Japan has already imported 15,000 metric tons of Peruvian fish meal, and, depending on domestic production in the fall of 1961, it was possible that another 5,000 tons would be imported at \$120 per ton c.i.f. This price is about the same as that of domestic fish meal. The Fisheries Agency believes that it would be to Japan's advantage to increase its domestic production of fish meal, which is higher in quality than the Peruvian product. (Suisan Keizai Shimbun, November 16, 1961.)

* * * * *

FISH MEAL FACTORYSHIP PRODUCTION OFF ANGOLA:

The Japanese fish meal factoryship Renshin Maru, 14,094 gross tons, operated by a Japanese fishery firm which commenced operations off the Angolan coast on December 1, 1961, was reported to be producing a little

Japan (Contd.):

over 100 metric tons of fish meal per day as of mid-December 1961. Under arrangements worked out between Angola and Japan, Angolan fishermen deliver their sardine catches to the Japanese factoryship. These deliveries were running 500 to 600 metric tons per day.

The Renshin Maru was scheduled to remain on the fishing grounds off Angola until early February 1962, by which time she hoped to produce 7,300 metric tons of fish meal, of which 2,300 metric tons were to be turned over to Angola.

The two Japanese 120-ton trawlers, Koshin Maru, Nos. 1 and 2, assigned to the Renshin Maru, conducted exploratory fishing off Angola. Reportedly, the two vessels have taken large quantities of sea bream and squid but very little shrimp. (Suisan Tsushin, December 15, 1961, and miscellaneous publications.)

Note: See Commercial Fisheries Review, January 1962 p. November 1961 p. 56, October 1961 p. 67.

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OCTOPUS LANDINGS:

Japan's landings of octopus in 1960 totaled 57,601 metric tons. Landings January-August 1961 amounted to 34,081 metric tons. The 1960 average f.o.b. price for frozen octopus was 9.8 U.S. cents a pound. Average monthly f.o.b. prices for 1961 per pound: January, 10.2¢; February, 9.1¢; March, 11.0¢; April, 12.6¢; May, 11.2¢; June, 11.8¢; July, 18.8¢; August, 15.4¢.



Liberia

JAPANESE-ITALIAN FISH PLANT FOR LIBERIA:

A joint Japanese-Italian company has completed plans for a \$400,000 fish processing and freezing plant with a daily freezing capacity of 20 tons and storage capacity of 2,000 tons. Bids will be invited shortly for construction along the north breakwater of the Free Port of Monrovia. Completion is expected by mid-1963. (United States Embassy, Monrovia, October 27, 1961.)



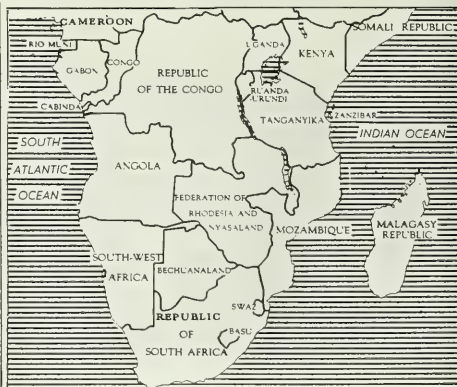
Malagasy Republic

EXPLORATORY FISHING FOR TUNA:

In July, August, and October 1961 the Maran Atha, research vessel of "Centre d'Océanographie et des Pêches" (Center of Oceanography and Fisheries of Nossi-Be sailed to the Majunga region (off the northwest coast of Malagasy) to test tuna fishing with Japanese long-lines in the Mozambique channel. These studies undertaken by the "Centre" at Nossi-Be for several years are carried out under



Fig. 1 - Maran Atha, research vessel of Centre d'Océanographie et des Pêches. Used Japanese long-lines to explore for tuna off northwest coast of Malagasy.



Malagasy Republic (Contd.):



Fig. 2 - Two species of tuna caught by the research vessel Maran Atha with Japanese long lines.

the aegis of the "Office de la Recherche Scientifique et Technique d'Outre-Mer" (Office of Overseas Scientific and Technical Research.

Tests first were carried out with trial gear in order to be able to assess the results immediately. A long line 4 kilometers (2.5 miles) long was used; it had 160 hooks. The line was hauled on board manually. The long line was anchored as close to the port as possible, i.e. somewhat beyond the continental shelf, about 50 km. (31 miles) from the shore.



Fig. 3 - Thresher shark (Alopias pelagicus) caught by the Maran Atha with long lines.

The average daily catch noted at 25 positions of the long line was 215 kg. (473 pounds) of tuna and 250 kg. (550 pounds) of shark. The maximum yield of tuna at one point of the fishing line was 491 kg. (1,080 pounds), the minimum yield 47 kg. (103 pounds).

In the region of Nossi-Be, the "Centre" has been setting up long lines regularly since August 1960. Exploratory fishing by boats of 6, 10, and 14 meters (20, 33, and 46 feet) achieved yields similar to those observed at Majunga. Thus, it is evident that for future commercial utilization, tuna is available all year round in the offshore waters of Malagasy.



Fig. 4 - Mako shark (Isurus oxyrinchus) caught by the Maran Atha with long lines.

Following these studies, a small fishing enterprise at Nossi-Be started using a drifting long line for tuna fishing. The advantage of using a drifting line is that it is very simple and no special equipment is needed. The Malagasy and Comorian seamen aboard the Maran Atha had no trouble whatsoever with the long line. However, considering the short distances between fishing areas, fishing could be easily carried out with small boats since it would not be necessary to hold the catch aboard for more than 24 hours.

The studies off Majunga were expected to continue in order to verify the results obtained.

Malagasy Republic (Contd.):

If the results are conclusive, a fishery co-operative could be established as a pilot operation. A long line of 7.5 to 9.3 miles will be fished daily and the average daily catch is expected to be 1,100 pounds of tuna. The tuna would be canned and the sharks reduced to fish meal.

--A. Crosnier and P. Fourmanoir



Malaya

FIRM HOPES TO EXPORT CANNED TUNA TO UNITED STATES:

A joint Malayan-Japanese tuna canning firm established by Japan two years ago at Penang, Malaya, is reported to have informally sought the Japanese Fisheries Agency's approval to pack tuna in brine for export to the United States. The company presently packs only canned tuna in oil for export to Europe.

The Japan Export Canned Tuna Producers Association violently opposed the establishment of the Malayan company because it feared that the company would eventually begin to pack tuna for export to the United States. The Canned Tuna Association can be expected to oppose any such move on the part of the Malayan firm, which claims that the report is unfounded. (Suisan Tsushin, November 15, 1961.)



Mexico

FISHERY ADVISORY COMMISSION CREATED:

A fishery advisory commission was established in Mexico by Presidential Decree (Diario Oficial, December 16, 1961) and, according to press reports, Ex-President Abelardo Rodríguez has been appointed president of the commission.

The duties of the National Fishery Consultative Commission (Comision Nacional Consultiva de Pesca) are strictly advisory and all administrative actions pertaining to fisheries remain with the Ministry of Industry and Commerce. †

The Commission consists of nine members: a president appointed by the President of Mexico, a Vice-President who shall be the Director of Fisheries, and one representative each from the Ministry of Marine, the Ministry of Treasury and Public Credit, the Ministry of Agriculture and Livestock, the National Bank for Cooperative Development, the National Company for Popular Subsistence, the National Storage Warehouses, and the Bank for Small Commerce.



This fresh-water fish farm, near Mexico City, is one of the numerous projects carried out by the Government to increase food production.

Although the Law of Ministries delegates to the Ministry of Industry and Commerce all matters pertaining to fisheries, during the course of time eight other government agencies have become involved in fisheries in one way or another. A representative of each of these agencies (with the exception of the Ministry of Hidraulic Resources which operates several fresh-water fish hatcheries) has been placed on the Commission. One of the principal functions of the Commission will be to coordinate the activity of the various agencies with respect to fisheries. The Commission will also advise on ways and means of increasing and improving the fisheries and fishing industry of Mexico. (United States Embassy, Mexico, December 20, 1961.)



Morocco

SARDINE PRODUCTION AND MARKETING:

Morocco's sardine canning season legally starts on June 1 and ends May 31.

Annual pack of 3 $\frac{1}{4}$ - to 4-ounce dingley-type flat cans, also known as quarter

Morocco (Contd.):

flats^{1/}, in 100-can cases fluctuated from 2,300,000 cases in 1956/57, to 1,800,000 cases in 1957/58, 1,300,000 cases in 1958/59, to 1,900,000 cases in 1959/60 and 2,350,000 cases in 1960/61.

The pack in 1960/61 consisted of all pilchards, packed principally in olive oil, peanut oil, soybean oil, and tomato sauce.

Out of total exports of 1,984,572 cases of pilchards in 1960/61, France received 691,500 cases, Germany 166,200 cases, Italy 124,000 cases, Ghana 106,700 cases, U.S.S.R. 78,600 cases, and Czechoslovakia 68,500 cases.

Morocco's pack June 1, 1961, to May 31, 1962, is expected to amount to 2,350,000 cases.

In Morocco there are 44 sardine-canning plants. The average wage paid to cannery workers is: women 15.5 U. S. cents per hour, men 17.5 cents per hour. Fishermen are paid about US\$77 a metric ton for the fish ex-vessel. The supply of raw fish available to the cannery has been variable.

Prices to the cannery are fixed by the export association and approved by the Government. Mandatory Government inspection as to quality of fish and pack is under the jurisdiction of the Office Cherifien d'Exportation, a Government agency. (United States Consulate, Casablanca, November 28, 1961.)

^{1/}The cans are about 4 inches long, 3 inches wide, and $\frac{3}{4}$ inch deep.

* * * * *

CANNED FISH EXPORT TRENDS:

During the first four months (June-September 1961) of the 1961/1962 packing season, exports of canned fish rose to 1,053,531 cases as compared to 829,265 cases the previous year. Exports by product were: sardines 823,393 cases, tuna 74,795 cases, others 150,343 cases.

Sharp competition has been encountered in foreign markets (except France with a duty-free contingent of 600,000 cases), particularly from Portugal which has lowered its prices. (United States Embassy, Rabat, November 30, 1961.)

New Zealand

FIRM HOPES TO CAN TUNA:

A New Zealand firm hopes to import Japanese frozen tuna and produce canned tuna, using Japanese canning techniques. The firm, located on Cook Island (west-southwest of Tahiti Island), wants to convert its fruit canning plant at Rarotonga Island (approximate location: 20° south latitude, 160° west longitude, south of Cook Island) for canning tuna. Japanese technicians would be invited to teach canning techniques to that company's cannery staff. For raw material, tuna loins would initially be imported from Japan, later whole frozen tuna.

The same company also plans to purchase fishing vessels to supply fish to its cannery. (Shin Suisan Shimbun Sokuho, November 18, 1961.)



Nigeria

JAPANESE PLAN TO ESTABLISH FISHING BASE HELD UP OVER FINANCIAL DIFFICULTIES:

The proposed establishment of a joint Nigerian-Japanese fishing base at Lagos, Nigeria, is reported to be running into financial difficulties. The two Japanese firms involved in the plan had hoped to finance the project with 500 million yen (US\$1.4 million), which they would borrow from the Overseas Economic Cooperative Fund, but their plan reportedly has bogged down due to the Cooperative Fund's reluctance to grant the necessary funds. One of the Japanese firms is a large fishing company and the other is a refrigeration equipment manufacturer.

The Overseas Economic Cooperative Fund as well as the Japanese Government are urging the two firms to increase their investments. However, the two firms, while admitting the commercial nature of their plan, feel that their venture would contribute to the promotion of the Japanese Government's policy of adjusting the present one-way export trade with Nigeria, normalize diplomatic relations with that country and, at the same time, would contribute to the development of Nigeria's fishery resources and fishery technology.

Meanwhile, a large United States fish-canning company is said to have indicated to the

Nigeria (Contd.):

Nigerian Government its desire to "concentrate its effort on fish processing if the Japanese have no intention of entering into this business." However, the Nigerian Government strongly favors conducting joint operations with the Japanese firms for two reasons: (1) to learn advanced Japanese fishing techniques so as to develop Nigeria's marine resources; (2) to reduce Nigerian imports from Japan.

A study made by the World Bank shows that Nigerian consumption of animal protein, is the lowest in the world. To supplement the deficiency of animal protein, Nigeria annually imports US\$28 million worth of dried fish from Norway. For Nigeria, the urgent task now is to acquire fishery techniques with which to develop her marine resources.

The plan to establish a joint fishing base in Nigeria rapidly gained momentum in July 1961 following an inspection tour of Nigeria by a group of Japanese Government officials, who opened negotiations with Nigerian Government leaders. In the course of negotiations, the fishing base plan proposed by the Japanese firms was brought up. The Nigerian Government responded enthusiastically to the plan and subsequently offered to advance 70 percent of the funds required to establish the joint company. Expecting the loan of \$1.4 million from the Overseas Cooperative Fund, the Japanese fishing company has already invested 100 million yen (US\$228,000) to equip fishing vessels and to furnish crews. However, the Japanese Finance Ministry, which approves all overseas investments, is now demanding that two firms either increase their investments or reduce the scope of their proposed fishing base in Nigeria. (Suisan Keizai Shimbun, December 8, 1961.)



Norway

TUNA FISHING INDUSTRY:

Before 1947, Norwegian fishermen caught some 200 metric tons of bluefin tuna every year with harpoons. In 1948 a few fishermen succeeded in catching tuna with purse seines. In 1949 landings increased to 2,500 tons, more than ten times as much as in the past. Encouraged by their success, a large number of vessel owners went in for purse-seine fishing for tuna which yielded 11,400 tons in 1952.

During four years, 1952-1955, Norway's tuna landings reached a peak of 8,000-10,000 tons per year. In 1956, however, the catch dropped to 4,500 tons. From that date up to 1960 it hovered around 3,000 tons. The number of purse seines fished during the peak year in 1955 was 433. Then the number started to decline gradually and in 1960 shrank one-fifth to 86. In 1960, the 86 purse seines yielded landings of 3,240 tons. Of the purse seines fished, 9 made no catch, 30 fished in the south of Stord and obtained average catches of 56 tons, valued at \$14,560, which was considered fair fishing.

The reason why landings drastically decreased in 1955 was that the fish schools stayed in offshore waters because of unfavorable weather conditions, instead of coming in to bays as they do during a year of abundant catches. Furthermore, tuna schools habitually move at the same speed as the bait fish they are chasing. They move fastest when they are not following their bait and fishing vessels have great difficulties in approaching the moving schools in offshore waters. The fishing season is from July-October. Especially toward the end of a season it is impossible for the fishing vessels to even approach the tuna schools close enough to fish. In the fall, the fish on which they feed become less and tuna go down deep into the water.

The Norwegian purse seine is 350 fathoms long with a mesh of 7.9 inches. A purse seiner has a deck of 60-70 feet and an auxiliary boat with a powerful engine. The seiner uses one other boat to handle the net. The crew of a vessel consists of 10-12 men. (Suisan Keizai Shimbun, November 24, 1961.)

* * * * *

WITHDRAWS FROM WHALING CONVENTION:

The Norwegian Government on December 29, 1961, served notice of its conditional withdrawal from the International Whaling Convention. The United States Government, as the depository Government of the Convention, was notified accordingly.

The Government decided to withdraw because it had not been possible to ascertain whether the conditions for Norway's continued adherence to the Convention could be fulfilled. These conditions, formulated in September 1960, are: (1) that the Netherlands rejoin the Convention; (2) that the Soviet Union confirm its

Norway (Contd.):

acceptance of 20 percent of the total international whaling quota as its share; and (3) that, within a reasonable time, an agreement be reached on distribution of the remaining 80 percent between Norway, Great Britain, Japan, and the Netherlands. The withdrawal notice will be cancelled if and as soon as an agreement concerning distribution of the international whaling quota is signed by the five whaling nations prior to July 1, 1962.

The primary objective of the Norwegian Government is to attain an arrangement whereby the whale stock can be effectively protected against extinction, thus safeguarding the existence of a viable whaling industry. This could best be achieved by concluding a quota agreement based on recommendations of the whaling conference in London in 1958, while maintaining the Whaling Convention. Towards that end, Norway is prepared to participate in discussions when and where it might suit the other whaling nations, according to the January 11, 1962, issue of News

Denmark do, he said, the joint EEC trade tariff would cause great difficulties. West Germany and Be-Ne-Lux already have raised their tariffs on frozen fish fillets.

The danger facing Norway, he warned, is that the fishing industry in the Common Market, well protected behind high tariff barriers, will expand and make the EEC area far more self-sufficient with fish products. And there are no markets to take the place of the EEC area, he observed. (News of Norway, December 14, 1961.)



Peru

EXPORTS OF MARINE PRODUCTS,
JANUARY-SEPTEMBER 1960-61:

Exports of principal marine products by Peru during the first nine months of 1961 were substantially greater than in the same period of 1960. Meal and oil exports were up considerably.

Peruvian Exports of Principal Marine Products

Marine Products	July-Sept. 1961			Jan.-Sept. 1961			Jan.-Sept. 1960		
	Value 1/			Value 1/			Value 1/		
	Qty.			Qty.			Qty.		
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal	187,104	366.3	13,668	548,158	968.2	36,127	383,600	850.2	30,749
Fish (frozen, canned, etc.)	12,699	67.2	2,507	28,490	196.2	7,321	24,862	155.6	5,627
Fish oil	21,598	60.8	2,269	76,288	214.7	8,011	23,728	67.9	2,456
Sperm oil	3,851	13.7	511	6,435	24.1	899	9,489	32.4	1,172
Fertilizer (guano)	1,432	3.6	134	5,308	14.0	522	9,941	24.5	886
Whale meal	990	1.3	49	4,097	5.7	213	1,513	2.6	94

1/ F, o, b, values converted at rate of 26.8 soles equal US\$1 for 1961 and 27.65 soles equal US\$1 for 1960.

of Norway of the Norwegian information Service.

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FISHERIES MINISTER'S VIEWS ON EEC:

In the opinion of Norway's Fisheries Minister, the fishing industry will likely be seriously affected whether or not Norway decides to join EEC--the European Economic Community. In view of this, he told the annual convention of the Sunnmøre Fishermen's Association, it is rather brash to oppose any link whatsoever with EEC.

The Minister observed that about 50 percent of the fish and fish products exported by Norway now goes to West Europe. If Norway fails to join EEC, while Great Britain and

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CONTROL OF CANNED TUNA
SALES TO EUROPE PROPOSED:

Peruvian canning industry representatives met with leading Japanese canned tuna exporters on November 24, 1961, in Tokyo to discuss means of regulating the sale of canned tuna and tuna-like fish in oil to Europe. The Peruvian representatives claimed that Japanese canned tuna in oil and Peruvian canned bonito were competing directly with each other for the European market, and that this price competition had driven down the prices for those products. Japanese exporters apparently have no intention of having the Japanese production of canned tuna for export to Europe, as well as sales, regulated at this time, as proposed by the Peruvian canners,

Peru (Contd.):

and this meeting is reported to have ended without definite agreement.

The Peruvian representatives later met with Japanese canned tuna packers from the Shizuoka area. They reportedly requested that Japanese canned tuna in oil, which is presently exported to Europe for around \$6.80 a case, be sold for \$7.00 a case f.o.b. Japan. Such a price hike is favored by some Japanese packers. However, it is unlikely that prices can be raised since the packers are not in a position to regulate export prices. (Suisan Tsushin, November 25 and December 6, 1961.)



Poland

TRAWLERS FISHING OFF GUINEA:

Two Polish lugger trawlers late in 1961 sailed for Guinea to operate with the Polish-Guinean fishing agency. It is anticipated that 10 additional vessels of this type will go to Guinea within a year.

In October 1960, an agreement was signed for the formation of a Polish-Guinean fishing company to begin operations in March 1961. Poland was to supply trawlers; the Guinean Government was to supply a base of operations, with a refrigeration plant, a fish meal plant, and warehouses. About 50 Guinean specialists and fishermen are to be trained in Poland. (The Fishing News, November 10, 1961.)

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FISHING PLANS FOR 1962:

Some details of the plans for Polish commercial fishing in 1962 were revealed in a report about a session of the Sejm Committee on Maritime Economy and Navigation (Trybuna Ludu, December 7, 1961). The fish catch in 1962 is supposed to increase to 139,000 metric tons, six percent higher than in 1961. Since this increase is to be achieved by fishing in "distant waters," fishing enterprises are supposed to receive two more trawlers equipped for some processing. Out of the investments planned for the development of fishing next year, 44 percent reportedly have been allotted for the port of Szczecin.

As a part of the 1962 plans of the fishing industry, a "small" improvement is hoped for in the supply of fish for the domestic market. It was admitted, however, that present motorized refrigeration equipment was barely sufficient for supplying 6,000 tons of fresh sprats to the country's inland markets. To improve this situation, the addition of 16 additional mobile refrigerated units is planned during the current five-year plan.



Portugal

RULES FOR ASSURING NORMAL SUPPLY OF GELLIDIUM TO AGAR-AGAR INDUSTRY:

Rules designed to assure the Portuguese agar-agar industry a normal supply of gelidium seaweeds were established when the Secretary of State and Commerce issued Ministerial Order No. 18796 in the November 3, 1961, issue of Diário do Governo.

The Order makes it mandatory for gelidium pickers to register all the amounts gathered by them with the semi-official Regulatory Commission of Chemical and Pharmaceutical Products (Comissao Reguladora dos Produtos Quimicos e Farmaceuticos) and requires local exporters, when applying for an export license, to place at the disposal of the local agar-agar industry an unspecified percentage of their inventories in order to assure a year's supply of the qualities of gelidium deemed most appropriate to the industry. The legislative measure also classifies gelidium into three qualities, depending on the gelose content, moisture and impurities, and establishes the respective prices effective until July 1, 1962, at which exporters will have to offer these qualities of gelidium to the industry.

The amounts offered by exporters and not acquired by the industry 15 days after an offer is made, may be freely exported. (United States Embassy, November 21, 1961.)



Rhodesia and Nyasaland Federation

LAKE KARIBA FISHING INDUSTRY:

By 1964, a minimum annual production of 12,000 metric tons of fish are expected to be

Rhodesia and Nyasaland Federation (Contd.):

produced from Lake Kariba (the world's largest man-made lake) in Rhodesia. In 1960, about 1,000 tons of fish were taken. The total catch will reach 4,000 tons in 1961. Estimates for annual production in 1962 and 1963 are 8,000 tons and 9,000 tons, respectively.

To develop the fishing industry on the Lake, several concessions have been granted. Two concessions, for 10 years each, on the Southern Rhodesian shore will have an annual quota of 1,300 and 700 tons, respectively. A Northern Rhodesian concession, for five years, will have an annual quota of 1,000 metric tons. The remaining annual catch goals will be purchased by the concessionaires from independent fishermen. After two years the concessions will be reviewed, with the Government reserving the right to alter them to conserve and protect the resource.

Sites for cold-storage and ice-manufacturing plants will be made available for private enterprise under five-year concessions. Land will also be available for lease in Northern Rhodesia for fish canning and fish meal manufacture. Five harbors to shelter the fishing fleet are in the process of construction with completion scheduled in 1962.

Eighteen varieties of fish including bream, live in the lake; the bream were introduced. To develop this fishing industry, about 250,000 acres of land were cleared, and 80,000 acres are already submerged. A Fisheries Research Institute will be established at Lake Kariba in 1962. (United States Consulate, Salisbury, November 10, 1961.)



South Africa Republic

ONE SPINY LOBSTER AREA
DESTROYED BY VOLCANO:

The volcanic eruption late in 1961 resulting in the evacuation of the Island of Tristan Da Cunha in the South Atlantic Ocean also did considerable damage to the spiny lobster industry in that area. Canning and freezing facilities on the Island have been reportedly destroyed beyond repair.

At the start of these operations by five South African companies in 1949, the Coloni-

al Development Corporation invested about \$365,000 in the project. Exploration of the area's spiny lobster resources showed fishing grounds about 45 miles long by about 2 miles wide capable of sustaining an annual yield of over one million pounds. Almost the entire production was shipped to the United States.

It is believed that the operations will be rebuilt as soon as possible. (The Fishing News, December 8, 1961.)



South-West Africa

SOUTH-WEST AFRICA PILCHARD-
MAASBANKER FISHERY
ATTAINS 1961 QUOTA:

By the end of September 1961, the six pilchard processing factories in Walvis Bay, South-West Africa, had taken all but 23,295 tons of the 375,000 short tons of pilchards, maasbanker, and mackerel they were permitted to catch during the 1961 season. Three of the six factories had stopped production on reaching their individual quotas and the last of the remaining three factories were expected to close down early in November.

Walvis Bay has a quota 62,500 tons allocated to each of its six pilchard factories and the South-West Africa Administration imposes no closed season on fishing. It has been found, however, that the best fishing months--with the highest oil yield from prime fat fish--are in the middle of the year, and operations usually extend from March-April through September-October. Most of the catch is pilchards in South-West Africa.

This year, although the permitted total catch was raised from 310,000 tons in 1960 to what will most likely be a permanent 375,000 tons, canned fish packing has been limited to a total lower than the record 4,600,000 cases packed in 1960. An interesting development in 1961 has been a big increase in the pack of the one-pound oval pack to meet a growing demand. In one large factory the oval pack will make up 10,000 tons of the total canned fish pack of just under 25,000 tons. Canned fish was reported to be selling steadily, but the short pack period results in an accumulation of canned fish stocks for sale over the whole year.

South-West Africa (Contd.):

As the factories close, the plants are stripped down, and machinery, buildings, and boats (most of them privately-owned) receive a thorough overhaul in preparation for the 1962 season.

With the 542,429 short tons of pilchards, maasbanker, and mackerel caught off South Africa's Cape coast and the 351,705 tons taken off Walvis Bay, the South African and South-West African pelagic shoal catch to the end of September totaled 894,134 short tons. (October 1961 issue of The South African Shipping News and Fishing Industry Review.)



Spain

VIGO FISHERIES TRENDS, 1961

Fish Exchange: During October 1961, a total of 10,571 metric tons of fish valued at 72.2 pesetas (US\$1.2 million), passed through the Vigo Exchange. In November this amount decreased to 6,632 tons valued at 57.6 million pesetas (\$1.0 million) because sardine landings dropped from 5,097 tons in October to 2,152 tons in November. Other species which also decreased were anchovy and horse mackerel.

However, the amount of fish handled for the first 11 months of 1961 was 20.5 percent more than in the same period in 1960.

Table 1 - Fish Handled by the Vigo Fish Exchange, January-November 1960-1961

Year	Qty.	Value		Avg. Price (Ex-Vessel)	
		Metric Tons	1,000 Pesetas	US\$ 1,000	Pesetas/ Kilo
1961	71,972	683,553	11,393	9.49	7.2
1960	59,728	604,000	10,067	10.11	7.6

While statistics for December were unavailable, it was expected that the amount of fish handled was lower than for November. But the year's total was expected to surpass totals for the last 30 years. Sardine and horse mackerel landings particularly contributed to this higher 1961 volume.

The first fish-freezing vessel of the Vigo fleet, the Lemos, came into port in early December with a cargo of 240 tons of hake and small hake (pescadilla), the result of a three months' trip in South American waters. The result in the market was not so promising, however, partly because of inadequate distribution facilities, and partly because the local conservative public, accustomed to fresh fish, looked askance at the frozen variety. Prices for the frozen hake dropped from 28 to 25 pesetas per kilo (21.2 to 18.9 U.S. cents a pound) ex-vessel despite the fact that fresh hake sold during the previous three months at an average price of 43 pesetas per kilo (32.5 cents a pound). The frozen fish has been stored until it seems opportune to make another attempt to sell it.

The Andrade, sistership of the Lemos, as of December 1961 was fishing in South African waters. The firm owning the vessels plans to acquire a transport vessel to permit a longer period of time for fishing. It also plans to build other vessels of the same type.

Canning: The activity of the fish canning industry decreased somewhat at the end of November owing to the smaller catches of sardine and greatly reduced landings of tuna (bonito). The lack of sardines in a period when cannery men were counting on a continued abundance took many cannery men, with foreign orders pending, by surprise. The decrease in catches (about 50 percent) contributed to the increase in sardine ex-vessel prices at the Vigo Exchange from 3.74 pesetas (2.8 cents a pound) in October to 5.08 pesetas (3.8 cents a pound) in November and presented a problem to packers who quoted canned sardines at competitive prices in the international market. During December, some cannery men found themselves obliged to buy sardines at any price in order to fill their commitments, and to avoid a total loss of their export market.

Even without considering it an outstanding year for exports, it is believed that 1961 will not fall behind 1960, but considerably under the hopes and plans of exporters who have, despite all, done quite well in the foreign market. The Government measure to grant a fiscal tax deduction for exports has favored sales abroad.

Cannery men are urging the Government to permit the free import of frozen tuna for canning; at present the duty is 19 percent ad valorem. On obtaining such authorization, it is planned to set up a regular flow of raw fish which will permit canneries to plan their production and sales for several months ahead, without being subject to the hazards impinging on the short and uncertain tuna season in Spain. As a rule, the season lasts from June to October-November, and only a very small number of cannery men have refrigeration facilities to store a certain amount of fish to provide work in periods of scarcity of fresh fish.

There is talk also of the possible formation of an association of cannery men to expand the export of canned albacore to the United States. Basically, 65 firms of the Northwest and Cantabrian region of Spain (43 in Galicia) have joined the plan. For the present, it would be limited to albacore and to the United States market, but it is expected to be the base for future associations which would apply to other species and other markets, if the plan works out.

The order (Boletín Oficial of August 26, 1961) which regulates the inspection of Spanish canned fish should have entered in force early in 1962, but it has been postponed for another year in some of its applications. At present there are no means for carrying out this inspection; moreover, the prime objective would be the standardizing of cans which would facilitate the control, and it is this aspect which will not go into effect until 1963. Plans and production methods, machinery, and even outmoded cans do not permit the immediate implementation of the law without hurting the cannery men. These maintain that control is already carried out by the importing countries, the majority of which have very strict rulings for the admission of food. (United States Consulate, Vigo, January 5, 1962.)

Note: Values converted at rate of 60 pesetas equal US\$1.



Sweden

SWEDEN REFUSES TO ISSUE FLOATING TRAWL PATENT TO DANE:

The long dispute over a Swedish patent on a Danish floating trawl was ended on October 13, 1961, when Swedish authorities dismissed the appeal of Robert Larsen of Skagen, Denmark, from a 1959 decision which refused him a patent for the reason that a patent had been issued four years earlier for a floating

Sweden (Contd.):

trawl of the same type to Aron and Yngve Bernhardsson of Foto, Sweden.

According to reports in Danish and Swedish fishery trade publications (Dansk Fiskeritidende, November 17, 1961; Vestjysk Fiskeritidende, November 10, 1961), Larsen had contended that his trawl was different because it was regulated by the length of the cables and the speed of the vessel whereas the Swedish trawl was regulated by means of floats. However, the Swedes were able to demonstrate that the two trawls operated on precisely the same principles, thus relieving many users of the Swedish trawl from possible economic claims by Larsen. (Report of December 13, 1961, from Fisheries Attache, United States Embassy, Copenhagen.)



Taiwan

JOINT AFRICA-TAIWAN
FISHING OPERATIONS:

Fishery cooperation agreements have been made by Taiwan with Malagasy and Liberia. The government-owned China Fisheries Corporation (CFC) is to send experienced fishermen to those countries to provide technical assistance to the local fishing industry. The CFC will also provide tuna to a cannery in Malagasy.

Under discussion is a joint fishing enterprise with Liberia whereby that country would provide shore facilities and the CFC would furnish capital investment in the form of fishing vessels. Also under consideration is an agreement with Sierra Leone for the use of port facilities. (United States Embassy, Taipei, November 7, 1961.)



U.S.S.R.

NEW FREEZER FISHING VESSEL:

The freezer vessel Bratsk was constructed for the Soviet fishing fleet by the East Germans in the city of Stralsund. The 2,495-gross-ton ship will carry a crew of 91, cruise at 11 knots, and carry enough fuel to remain at sea for 40 days. Its 2 ammonia

refrigeration units can freeze 50 tons of fish every 24 hours and maintain the total hold capacity of 800 tons at minus 18° C. (-0.4° F.). The Bratsk will be incorporated into the Kaliningrad fishing fleet. From Rybnoe Khoziazstvo (Fishing Industry), No. 8, August 1961.

NEW TYPE FACTORYSHIP FOR
WHALING AND FISHING:

A whaling mothership (17,000 gross registered tons) valued at approximately DM65 million (\$16.3 million) was launched at the end of November 1961 by the Government-owned shipyard of Kiel, which constructed the ship under a U.S.S.R. order placed in the middle of 1960. In the course of the ceremonies, the wife of the Soviet Ambassador to Bonn named the ship Vladivostok.

The ship represents a new type in the field of whaling and deep-sea fishing and was constructed according to plans based upon the findings of Soviet scientific research. It will serve as whaling mothership and also as a fish cannery. She is equipped with a landing deck for a helicopter which can be used to locate the whales and fish for the smaller boats.

This is the first of two ships of this type and size ordered by the U.S.S.R. in June 1960 for delivery in 1962. A second vessel will be delivered in 1962.

The Japanese were the first to develop a factoryship capable of performing the dual functions of whaling and fishing. The Vladivostok can also produce frozen fish, fish-liver paste, and vitamin-rich fish oils. The vessel has a speed of 14 knots and will be manned by a crew of 408 men. (Le Marin, December 8, 1961; United States Consulate, Bonn, December 15, 1961.)

PROGRESS IN FROZEN
FISH PRODUCTION:

In June 1961, the Central Committee of the Communist Party noted the importance of the use of freezing (especially blast-freezing) in the production, storing, and transportation of fish products. U.S.S.R. production of frozen fish products increased from 442,400 metric tons in 1950 to 674,000 tons in 1960; production of salted fish products has declined.

U. S. S. R. (Contd.):

In 1958, about 31 percent of the fishing fleet was equipped with refrigerated holds, and by 1960 this was increased to 44 percent. The quality of refrigeration has been improved by (1) lowering hold temperatures from 10.40-14° F. to minus 0.40-13° F., (2) equipping factoryships with efficient air apparatus for blast freezing, and (3) providing generators to produce ice from sea water. In 1965, according to the Seven Year Plan, 1,230,000 metric tons of fish will be blast-frozen, compared to 540,000 tons in 1960. From Rybnoe Khoziaistvo (Fishing Industry), No. 8, August 1961; FAO Yearbook of Fishery Statistics, 1960.

SALMON CULTURE SUCCESSFUL:

The Soviets have made significant advances in the culture of chum salmon. The Steplovsii Fish Culture Station of the Amur River Basin in the Far East has substantially increased autumn chum runs from 2,000 to 6,000 spawners before 1928 to 60,000 spawners in 1960.

Marking experiments showed that survival of cultured fish, as indicated by adult returns, was 1 percent as compared to a natural survival of 0.1 percent.

Similarly, two fish-culture stations, established along the Takoe River on Sakhalin Island, have increased annual chum runs from 400 to 40,000 spawners over a 30-year span. Success is believed due to the release of chum salmon one month to two years old. The Soviets stated that significant numbers of artificially-reared chum probably are taken in high-seas catches, particularly by the Japanese. From Rybnoe Khoziaistvo (Fishing Industry), No. 4, April 1961.

FISHERY LANDINGS INCREASED IN 1960:

The U. S. S. R. continued its rapid strides in fishery expansion with a 1960 catch of 3,051,000 metric tons of fishery products and about 450,000 tons of whales. In world fishery production, the U. S. S. R. now ranks ahead of the United States, following only Japan, Communist China, and Peru. The Soviet catch has doubled since 1950, mainly because of the addition of many high-seas fishing vessels to its fleet. In 1960, about 78 percent of the U. S. S. R. catch was taken by high-seas vessels, compared with only 34 percent in 1950. A total catch of 4,620,000 tons is planned for 1965.

The Soviet Union's 1960 catch exceeded all expectations. Almost 2,000,000 tons of it found its way to the Soviet consumer's table.



Fig. 1 - Typical Russian trawler fishing in North Pacific and Bering Sea.

U. S. S. R. (Contd.):

U.S.S.R. Fishery Landings by Principal Species, 1959-60		
Species	1960	1959
	(1,000 Metric Tons)	
Herring and related species:		
Atlantic herring	523.4	464.3
Pacific herring	193.0	235.3
Other	367.1	356.7
Total	1,083.5	1,056.3
Cod and related species:		
North Atlantic species	439.8	293.7
Alaska pollock	109.2	51.6
Pacific species	32.1	28.9
Baltic cod	91.4	40.5
Total	672.5	414.7
Flounder and related species:		
Pacific Ocean species	219.0	191.2
Other	22.7	12.6
Total	241.7	203.8
Other species:		
Salmon and related species	120.5	142.2
Ocean perch or redfish	183.9	243.5
Other marine fish	247.9	183.8
King crab and other shellfish	37.4	32.8
Marine animals and residue	32.0	13.5
Total marine production	2,619.4	2,290.6
Fresh-water fish	431.6	465.4
Grand total	3,051.0	2,756.0

Sources: Food and Agriculture Organization Yearbook of Fishery Statistics, 1960; Bureau of Fisheries (Fishing Industry), No. 5, May 1961; and Australian Fisheries Newsletter, November 1961.

With the exception of the Far East deep-sea fleet, all branches of the industry over-fulfilled their plan. The Black Sea deep-sea fleet's sardine operations off West Africa



Fig. 2 - Another Russian trawler with nets spread out to dry. Vessel is underway.

were highly successful, and the cod and herring fisheries did extremely well.

The stern-fishing factory-trawler has become the standard deep-sea vessel and the basic design has now been attained in the Leskov class being built in Poland. The dimensions of this latest trawler are: Overall length, 279 ft. 6 in.; between perpendiculars, 246 ft.; beam, 45 ft. 4 in.; depth, 23 ft.; draught, 17 ft. 6 in.; displacement, 2,298 tons; dead-weight, 1,240 tons; speed, 12.5 knots.



Fig. 3 - Russian fishery factoryship (length about 150 feet) operating in Bering Sea.

The main improvements over the earlier Pushkin class are a decrease of 8 inches in the freeboard, reducing the wind area and consequential drift when trawling, and a lengthening by 6 ft. of the trawl deck to 66 ft., thus enabling the entire trawl to be hauled on deck in one operation.

There is also an impressive increase in fish hold space over the Maiakovski class. This has been obtained by reducing the fuel capacity to 500 tons and by using a less bulky main engine. It appears that the Maiakovskis were returning home with 150 tons of Diesel fuel and 60 tons of boiler oil still in their tanks.

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NORTHWEST ATLANTIC FISHERIES, 1956-60:

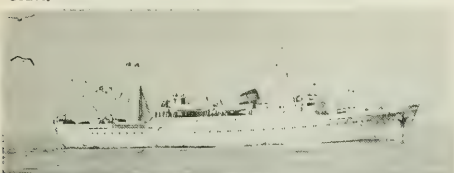
The U.S.S.R. began fishing in Northwest Atlantic waters in 1956 after conducting exploratory cruises in 1955. According to the International Commission for the Northwest Atlantic Fisheries (ICNAF), the Soviets have reported annual catches that have rapidly increased from 17,000 metric tons in 1956 to over 258,000 tons in 1960.

Table 1 - U.S.S.R. Catch in ICNAF Convention Area, 1956-1960

Species	1960	1959	1958	1957	1956
	(Metric Tons)				
Cod	139,612	15,453	5,826	18,041	3,001
Haddock	104,147	155,004	108,900	48,805	12,908
Ocean perch	237	224	89	212	104
Halibut	4,392	678	267	819	12
Flounder	9,686	10,578	1,674	1,458	984
Others					
Total	258,074	181,937	116,756	69,335	17,009

U. S. S. R. (Contd.):

In a period of four years, the U.S.S.R. fisheries have expanded to account for about 12 percent of the over two million tons of fish taken annually in the Convention Area and to lead the other member nations in the ocean perch catch. Fishing for ocean perch, cod, and haddock has been conducted on the banks off Newfoundland and Labrador. In 1961, Soviet fishing fleets moved southward to Georges Bank off the United States coast.



Large Soviet stern trawler (Majakovski class) fishing in North Atlantic on the "northern edge" of Georges Bank in October 1961. Trawler's home port is Klaipeda.

The Soviet fishing fleet operating in the Convention Area during 1959 consisted of 111 vessels with a total tonnage of 126,596 tons. Operations have been characterized by the use of large stern factory-trawlers as well as conventional trawlers; the larger types have refrigerated holds.

Table 2 - U.S.S.R. Trawler Fleet Fishing in ICAF Convention Area, 1959

Tonnage Class	No. of Vessels	Total Tonnage	Average Tonnage
151-500	39	10,296	264
501-900	31	19,500	630
901-1,800	6	7,200	1,200
Over 1,800	35	89,600	2,560
Totals	111	126,596	1,141

Home ports reported for the Soviet vessels were Murmansk on the Barents Sea, and Kaliningrad, Klaipeda, and Riga on the Baltic Sea. (International Commission for the Northwest Atlantic Fisheries, *Statistical Bulletins*, vol. 7-8; 1959 and 1960.)



United Kingdom

AID FOR FISHING INDUSTRY:

In seven years (1954 through March 31, 1961) Britain's White Fish Authority has financially assisted the industry to the extent of £39,984,137 (almost US\$112 million) in loans and grants.

Loans totaled £28,228,884 or \$79 million (£23,424,516 or \$65.6 million for the near-middle water fleet and £4,804,368 or \$13.4 million for the inshore industry) and grants amounted to £11,755,253 or \$32.9 million (£9,334,200 or \$26.1 million and £2,421,053 or \$6.8 million, respectively). All loans and grants were for vessels, except £566,399 or \$1.6 million for inshore engines.

In addition to this financial aid, the British Government also assists the industry through the white fish and herring industry subsidies. These were extended in 1961 to compensate for the loss of traditional British fishing grounds.

It is estimated that the white fish subsidy will cost £1,497,064 (\$4.2 million) for the near-middle water fleet and £591,826 (\$1.7 million) for the inshore industry, but distant-water trawlers also will be subsidized at the rate of £17 (\$47.60) for every day at sea. The daily rate for near-middle water vessels will vary, depending on vessel size, except in the case of coal burners which will be paid £10 (\$28.00) a day at sea. The inshore subsidy is paid on landings and has been raised by 4d. per stone (31 U.S. cents a hundredweight) to 1s. 2d. a stone (\$1.16 a hundredweight) for gutted and 1s. a stone (\$1.00 a hundredweight) for round fish. The new white fish subsidies came into force on August 1, 1961.

The herring industry subsidy (as from September 1) ranges from 3½ d. per stone (27.5 U.S. cents a hundredweight) to £12-£14 (\$33.60-\$39.20) a day at sea. The Herring Industry Board will also continue to pay a subsidy to maintain prices for surplus herring used for meal and oil production.

Loss of British fishing grounds will follow Britain's agreements with Norway and Iceland over their unilateral claim to a 12-mile territorial sea. Until October 31, 1970, British vessels will be able to continue to fish in a zone between 6 and 12 miles off the Norwegian coast. After that date they will have to stay outside 12 miles.

The agreement with Iceland provides that until March 1964, British vessels will continue to fish at certain seasons and in certain areas in a 6-12 mile zone around Iceland.

Following Britain's agreements with Norway and Iceland, the Soviet Union gave notice to terminate an agreement which has enabled British vessels to fish in certain Russian northwest waters within 12 miles of the coast. The Soviet Union also has claimed a 12-mile limit.

Speaking in the House of Commons debate when the new subsidies were approved, the Minister for Agriculture and Fisheries said that Britain's agreements with Iceland and Norway were expected to result in a drop of 25 percent in the total British distant-water catch. This would be equivalent to a loss of £5½ million (\$15.4 million) and he doubted whether the vessels by fishing elsewhere could make up more than two-thirds of it. That would mean a net loss of about £2 million (\$5.6 million) and the Government had decided to make up £1,250,000 (\$3.5 million) of it. That worked out at £17 (\$47.60) a vessel a day, or £5,500 (\$15,400) a year towards the estimated loss of £8,000 (\$22,400).

The above data on White Fish Authority loans and grants are from the Authority's annual report to March 31, 1961. The term "white fish" excludes pelagic fish and shellfish.

White fish landings in the United Kingdom in the calendar year 1960 totaled 805,028 metric tons, worth £60,686,102 (£169.9 million). Landings by British vessels totaled 693,239 tons and by foreign vessels (fishing and other) 111,789 tons. Of the British vessel landings, half was taken by the distant-water fleet, one-third by the near-middle water fleet, and the remainder by the inshore industry.

Distant-water vessels dropped in number by 10 to 229 and near-middle water vessels by 26 to 502.

The White Fish Authority's income for the year totaled £325,309 or \$910,900 (£235,840 or \$660,300 from general levy) and expenditures £310,272 (\$868,800), leaving a surplus of £15,037 (\$42,100). Expenditures comprised mainly general administration £137,185 (\$384,100), publicity £74,882 (\$209,700), fishermen's training courses £31,184 (\$87,300), research and experiments £29,609 (\$82,900). (*Fisheries Newsletter*, November 1961.)





FEDERAL ACTIONS

Department of the Interior

AMERICAN FISHERIES ADVISORY COMMITTEE--OBJECTIVES, RESPONSIBILITIES, AND AUTHORITY:

The objectives, responsibilities, and authority of the American Fisheries Advisory

Office of the Secretary

COMMITTEE MANAGEMENT American Fisheries Advisory Committee

The following material is a portion of the Departmental Manual and the numbering system is that of the Manual.

PART 630--AMERICAN FISHERIES ADVISORY COMMITTEE

CHAPTER 1--OBJECTIVES, RESPONSIBILITIES, AUTHORITY

1. *Objectives.* The objective of the American Fisheries Advisory Committee is to consider and give advice and make recommendations on the matters relating to the commercial fisheries programs in the Department of the Interior. The Committee shall strive toward the furtherance of coordination in research programs, and the promotion of better relations within the fishing industry and the public.

2. *Responsibilities.* The Committee shall be responsible to the Secretary of the Interior and shall submit to him its advice and recommendations on fishery matters in regard to the formulation of policy, rules, and regulations pertaining to requests for assistance and other matters as deemed appropriate by the Chairman of the Committee for consideration by the Committee. The American Fisheries Advisory Committee shall:

A. Consider the problems of producers, processors, distributors, and consumers;

B. Review the current research and other programs of the Bureau of Commercial Fisheries and recommend adjustments, terminations, and expansions, in order that available funds will be used on problems of greatest importance;

C. Recommend new work or the expansion of current programs and advise with respect to the relative priorities to be given various programs;

D. Consider future needs arising from long-term trends in world fisheries and international use of high-seas resources, plus the changes in the needs of the United States industry.

3. *Authority.* The Secretary of the Interior is authorized " * * * to appoint an advisory committee of the American fishing industry * * * " under the provisions of the Saltonstall-Kennedy Act of

July 1, 1954 (68 Stat. 376; 15 U.S.C. 713c-3), as amended. The Committee is authorized by the same act to advise the Secretary of the Interior in the formulation of policy, rules, and regulations pertaining to requests for assistance from the commercial fishing industry and other matters.

A. Definitions.

A. *Chairman.* The Chairman of the American Fisheries Advisory Committee shall be the Assistant Secretary for Fish and Wildlife, Department of the Interior.

B. *Executive Secretary.* The Executive Secretary shall be a full-time, salaried, career Federal Civil Service employee to be designated by Director, Bureau of Commercial Fisheries.

C. *Industry representative.* Industry representatives shall also be referred to as "Committee members" and are appointed by the Secretary of the Interior, under the authority vested in him under the Saltonstall-Kennedy Act of July 1, 1954, as amended, and under the provisions of Chapter 2 of this Part.

CHAPTER 2--POLICIES AND PROCEDURES

1. *Composition of committee.* The American Fisheries Advisory Committee shall consist of not more than 20 members and not less than 12 members, of which 50 percent shall constitute a quorum at any meeting for the conduct of Committee business.

2. *Qualifications for membership.* Persons appointed to the American Fisheries Advisory Committee shall be individuals actively engaged in the commercial fishing industry of the United States of America and, to the extent that it is possible, should represent the following industry segments:

A. Commercial fishery producers, processors, and distributors;

B. Representatives of fishermen's co-operatives, including fishermen actively engaged in a commercial fishery;

C. Officials or executives of trade associations and labor unions, provided they spend a principal portion of their working time in the operation of a business which is a constituent unit of the commercial fishing industry, and if his position as a trade association official or executive is incidental to that activity, No person appointed to membership on the American Fisheries Advisory Com-

mittee shall be considered as representing a trade association or labor union.

3. *Terms of appointment for industry representatives.*

A. *Appointment period.* The term of office for Committee members is 3 years, with approximately one-third of the membership of the Committee changing each year. All terms of office shall terminate on the 30th of June in the calendar year designated by the Secretary of the Interior in his letter of appointment.

B. *Reappointment to committee.* Upon completion of one 3-year term of office or portion thereof, a Committee member shall be eligible, at the discretion of the Secretary of the Interior, for appointment to an additional term of office of 3 years. No Committee member may serve more than 6 consecutive years.

C. *Vacancies on the committee.* Vacancies shall be filled for the unexpired terms of Committee members in accordance with Chapter 2.2 of this Part.

(1) A replacement appointee shall be eligible, at the discretion of the Secretary of the Interior, for appointment for one additional 3-year term.

4. *Alternates.* No Committee member may be represented by an alternate.

5. *Allowances for committee members.* Members shall receive no compensation unless authorized by the Secretary of the Interior, subject to the provisions of Section 15 of the Act of August 2, 1946 (60 Stat. 810; 5 U.S.C. 55a). Committee members shall be reimbursed for travel expenses to and from Committee meetings at standard government rates.

6. *Committee meetings.*

A. *Number of meetings.* The American Fisheries Advisory Committee shall meet at least once each year.

B. *Place of meetings.* The time and place of all meetings of the Committee shall be determined by the Chairman of the Committee.

C. *Agenda.* The agenda of meetings held by the Committee shall be initiated within the Department of the Interior by the Bureau of Commercial Fisheries, and shall be approved by the Chairman of the Committee. Upon approval of the Chairman, the agenda shall become available to the members of the Committee prior to the meeting.

D. *Minutes of meetings.* The Executive Secretary shall be responsible for

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D. *Minutes of meetings.* The Executive Secretary shall be responsible for

preparation of summary minutes of all meetings held by the Committee.

7. *Information.* Requests for information concerning the activities and functions of the American Fisheries Advisory Committee should be addressed to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington 25, D.C.

JAMES K. CARR,
Under Secretary of the Interior.

* * * * *

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

FEDERAL STANDARD FOR GRADES OF FROZEN FRIED BREADED SCALLOPS:

A voluntary standard for grades of frozen fried breaded scallops was announced in the December 14, 1961, Federal Register. The standard is the first issued by the Department of the Interior prescribing Government standards for frozen fried scallops and became effective on January 14, 1962.

The standard points out that frozen fried scallops are prepared from the whole or cut adductor muscles of the sea scallop (*Placopecten magellanicus*), or scallop units cut from a block of frozen sea scallops, that are coated with wholesome batter and breading and precooked in oil or fat, and then packaged and frozen. They contain a minimum of 60 percent by weight of scallop meats.

Three grades have been set up for frozen fried breaded scallops: (1) "U. S. Grade A" possess good flavor and odor and a total score for factors of quality of not less than 85 points; (2) "U. S. Grade B" possess at least reasonably good flavor and odor, and a score of not less than 70 points; (3) "Sub-standard" fail to meet the requirements of U. S. Grade B.

As published, the standard describes the product, styles of pack, grades, factors of quality (ascertaining the grade; evaluating the unscored factor of flavor and odor; evaluating and rating the scored factors of appearance, uniformity, absence of defects and character; appearance; uniformity; absence of defects; and character); definitions and methods of analysis; and lot certification tolerances.

Notice of intention to establish scallop standards was published in the July 20, 1961, Federal Register. Interested persons had until August 19, 1961, to submit written comments, suggestions, or objections regarding the proposal. One objection was received and was considered by the Fish and Wildlife Service.

Standards have already been established for frozen fish blocks, frozen fried fish sticks, frozen raw breaded fish portions, frozen cod fillets, frozen haddock fillets, frozen ocean perch fillets, frozen halibut steaks, frozen salmon steaks, frozen raw breaded shrimp, and frozen raw headless shrimp. These standards were developed by the Bureau of Commercial Fisheries, Fish and Wildlife Service, in cooperation with the fishing industry.

In addition to the standards program, the Department conducts a continuous inspection service in which 40 processors producing 170 million pounds of fishery products annually participate. Participation is voluntary. Processors who come under the inspection service and produce fishery products in accordance therewith may display the Department of the Interior "shield of quality" on the packages containing those products. The Department also conducts a program under which fishery products are inspected by lot and the product is certified, attesting to its quality and condition.

The standard as published in the Federal Register follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 270—UNITED STATES STANDARDS FOR GRADES OF FROZEN FRIED SCALLOPS

On page 6518 of the FEDERAL REGISTER of July 20, 1961, there was published a notice and text of a proposed new part 270 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Fried Scallops under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given until August 19, 1961, to submit written comments, suggestions or objections with respect to the proposed new part. One objection was received and considered and the proposed new part is hereby adopted without change and is set forth below. This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: December 8, 1961.

JAMES K. CARR,
Acting Secretary of the Interior.

PART 270—UNITED STATES STANDARDS FOR GRADES OF FROZEN FRIED SCALLOPS¹

PRODUCT DESCRIPTION AND GRADES

Sec.	
270.1	Product description.
270.2	Styles of frozen fried scallops.
270.3	Grades of frozen fried scallops.

FACTORS OF QUALITY

Sec.	
270.11	Ascertaining the grade.
270.12	Evaluating the unscored factor of flavor and odor.
270.13	Evaluating and rating the scored factors of appearance, uniformity, absence of defects and character.
270.14	Appearance.
270.15	Uniformity.
270.16	Absence of defects.
270.17	Character.

DEFINITIONS AND METHODS OF ANALYSIS

270.21	Definitions and methods of analysis.
	LOT CERTIFICATION TOLERANCES
270.25	Tolerances for certification of officially drawn samples.

AUTHORITY: §§ 270.1 to 270.21 issued under 16 U.S.C. 742e.

PRODUCT DESCRIPTION AND GRADES

§ 270.1 Product description.

Frozen fried scallops are prepared from wholesome, clean, adequately drained, whole or cut adductor muscles of the sea scallop (*Placopecten magellanicus*), or scallop units cut from a block of frozen sea scallops, that are coated with wholesome batter and breading and pre-cooked in oil or fat. They are packaged and frozen according to good commercial practice and are maintained at temperatures necessary for preservation. Frozen fried scallops contain a minimum of 60 percent by weight of scallop meat.

§ 270.2 Styles of frozen fried scallops. The styles of frozen fried scallops include:

(a) *Style I Random pack.* Scallops in a package are reasonably uniform in weight and/or shape. The weight or shape of individual scallops are not specified.

(b) *Style II Uniform pack.* Scallops in a package consist of uniform shaped pieces which are of specified weight or range of weights.

§ 270.3 Grades of frozen fried scallops.

(a) "U.S. Grade A" is the quality of frozen fried scallops that possess good flavor and odor; and for those factors of quality which are rated according to the scoring system outlined in this part, the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen fried scallops that possess at least reasonably good flavor and odor; and for those factors of quality which are rated according to the scoring system outlined in this part, the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen fried scallops that fail to meet the requirements of U.S. Grade B.

FACTORS OF QUALITY

§ 270.11 Ascertaining the grade.

The grade of frozen fried scallops is determined by examining the product in

the frozen and cooked states. Factors of quality evaluated in ascertaining the grade of the product are flavor and odor, appearance, uniformity, absence of defects, and character.

(a) Flavor and odor are rated directly by organoleptic evaluation.

Score points are not assessed (see § 270.12).

(b) Appearance, uniformity, absence of defects, and character are rated numerically on a scale of 100. The maximum number of points that may be given each of these factors are:

Factors:	Points
Appearance	25
Uniformity	20
Absence of defects	40
Character	15
Total possible score	100

¹ Frozen fried scallops which receive the maximum number of deduction points for any of these factors shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.12 Evaluating the unscored factor of flavor and odor.

(a) "Good flavor and odor" (essential requirements for a Grade A product) means that the cooked product has flavor and odor characteristics of good scallop meat and of the breading and is free from staleness and off-flavors and off-odors of any kind.

(b) "Reasonably good flavor and odor" (minimum requirements of a Grade B product) means that the cooked product is lacking in good flavor and odor, but is free from objectionable off-flavors and off-odors of any kind.

(c) "Substandard flavor and odor" (Substandard grade) means that the flavor and odor fails to meet the minimum requirements of "reasonably good flavor and odor."

§ 270.13 Evaluating and rating the scored factors of appearance, uniformity, absence of defects, and character.

Point deductions are allotted for each degree or amount of quality variation within each of the factors that are scored. The net score for each quality factor is obtained by subtracting the deduction-points assessed for that factor from the maximum points allotted to that factor. The total score for the product is the sum of the net scores for the four individually scored factors.

§ 270.14 Appearance.

(a) Appearance refers to the condition of the package and ease of separation in the frozen state and continuity and color in the cooked state.

(1) "Condition of the package" refers to freedom from packaging defects and the presence in the package of oil, and/or loose breading, and/or frost. Deduction points are based on the degree of the improper condition as small or large.

(2) "Ease of separation" refers to the difficulty of separating scallops that are frozen together after the frying operation and during freezing.

(3) "Continuity" refers to the completeness of the coating of the product in the cooked state. Lack of continuity is exemplified by breaks, ridges and/or lumps of breading. Each $\frac{1}{16}$ square inch area of any break, ridge, or lump of breading is considered an instance of lack of continuity. Individual breaks, ridges, or lumps of breading measuring less than $\frac{1}{16}$ square inch are not considered objectionable. Deduction points are based on the percentage of the scallops within the package that contain small and/or large instances of lack of continuity.

TABLE I—SCHEDULE OF POINT-DEDUCTIONS FOR VARIATIONS IN APPEARANCE

Appearance subfactors	Method of determining subfactor scores.	Deduction points
Condition of the package in the frozen state.	Degree of condition of the package	
	(a) Small (moderate amount of free oil, and/or loose breading, and/or frost, and/or packaging defects). (b) Large (excessive amount of free oil, and/or loose breading, and/or frost, and/or packaging defects).	2 5
Ease of separation of the scallops in frozen state.	Degree of ease of separation	
	Moderate (scallops separated by hand with difficulty). Severe (scallops separated only by use of knife or other instrument).	0 2
Continuity of the scallops in the cooked state.	Percent of scallops affected	
	Over Not over	0 30 30 70 70 100 100 100
Color of the scallops in the cooked state.	Deviation from predominating color of fried scallops in cooked state	
	Small instance of deviation in color means that the scallop varies noticeably from the predominating color of the package after cooking. Large instance of deviation in color means that the scallop varies markedly from the predominating color of the package after cooking.	0 10 10 30 30 50 50 70 70 100 100 100

¹ Each $\frac{1}{16}$ square inch is considered an instance.

¹ Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

(4) "Color" refers to reasonably uniform color which is characteristic of the product in the cooked state.

Deviations in color are visually measured as "small" and "large". A "small" instance of deviation in color means that the scallop varies noticeably from the predominating color of the package. A "large" instance of deviation in color means that the scallop varies markedly from the predominating color of the package. The deduction points assessed are based on the degree of deviation as small or large and the percentage by count of the scallops affected in the package.

(b) For the purpose of rating the factor of appearance, the schedule of deduction points in Table I applies. Frozen fried scallops which receive 25 deduction points for the factor of appearance shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.15 Uniformity.

(a) Uniformity refers to the degree of freedom from undesirable small pieces and to the degree of uniformity of the weights of the frozen fried scallops within the package.

(1) For Style I, deduction points are assessed for (i) undesirable small pieces as determined by the percent by count of pieces passing through a sieve with $\frac{3}{4}$ inch openings, and (ii) uniformity of size of the scallops remaining in the sieve as determined by the ratio of the weight of the 15 percent largest scallops (minimum three) divided by the 15 percent smallest scallops (minimum three). The number constituting this percentage shall be the closest approximation of 15 percent, determined by count.

(2) For Style II, deduction points are based on the percentage by count of small or large scallops deviating from the average weight within the package.

(b) For the purpose of rating the factor of uniformity, the schedules of deduction points in Table II apply. Frozen fried scallops which receive 20 deduction points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 270.16 Absence of defects.

(a) Absence of defects refers to the degree of freedom from doubled and misshaped scallops, pieces of shell fragments and extraneous material. The defects of doubled and misshaped scallops are determined by examining the frozen product, whereas the defects of shell fragments and extraneous materials are determined by examining the product in the cooked state. Deduction points are based on the percentage by count of the scallops affected within the package, or the relationship between the number of defect instances and the number of scallops within the package.

(1) *Doubled scallops.* Two or more scallops that are joined together during the breading and/or frying operations.

(2) *Misshaped scallop.* Elongated, flattened, mashed or damaged scallop meats.

TABLE II—SCHEDULE OF POINT-DEDUCTIONS FOR UNIFORMITY

Factor	Method of determining subfactor score	Percent of scallops affected		Deduction points
		Over—	Not over—	
Uniformity of size and weight of scallops in frozen state.	A. Style I (Random pack)			
	(a) Undesirable small pieces which pass through a sieve with $\frac{3}{4}$ inch openings.			
		0	10	3
		20	20	6
		20	20	10
	Ratio			
		Over—	Not over—	
		2.0	2.5	0
		2.5	2.9	3
		2.9	3.3	10
	(b) Weight ratio of scallops remaining in the sieve. The 15 percent largest scallops (minimum three) divided by the 15 percent smallest scallops (minimum three). The 15 percent to be determined by count.			
	B. Style II (Uniform pack)			
	Deviation from average weight			
	(a) Small scallops deviating ± 10 to 20 percent from average weight.			
		0	30	3
		30	70	5
		70	70	10
	(b) Large scallops deviating over ± 20 percent from average weight.			
		0	30	6
		30	70	10
		70	70	20

TABLE III—SCHEDULE OF POINT-DEDUCTIONS FOR ABSENCE OF DEFECTS SUBFACTORS MISSHAPE OR DOUBLED SCALLOPS AND SHELL FRAGMENTS

Defect subfactors	Method of determining subfactor score	Percent of scallops affected		Deduction points
		Over—	Not over—	
Misshaped or doubled scallops in the frozen state.	Misshaped scallops (elongated, flattened, mashed or damaged scallop meats). Doubled scallops (two or more scallops joined together during breading and/or frying operation).	0	10	3
		10	20	7
		20	20	15
Shell fragments in the cooked state.	Each piece of shell fragment is considered an instance.	0	5	15
		5	10	30
		10	—	40

TABLE IV—SCHEDULE OF POINT-DEDUCTIONS FOR ABSENCE OF DEFECTS SUBFACTOR OF EXTRANEOUS MATERIAL

Number of scallops per 7 ounces	Number of instances of extraneous material									
	0	1	2	3	4	5	6	7	8 or more	
Deduction points										
10 or less	0	7	15	25	40	—	—	—	—	—
11	0	6	15	25	40	—	—	—	—	—
12	0	6	13	25	40	—	—	—	—	—
13	0	5	12	25	40	—	—	—	—	—
14	0	4	10	15	25	40	—	—	—	—
15	0	4	9	15	25	40	—	—	—	—
16	0	3	8	13	25	40	—	—	—	—
17	0	3	8	12	20	30	40	—	—	—
18	0	2	7	10	18	28	40	—	—	—
19	0	2	6	9	15	25	40	—	—	—
20 or more	0	2	5	8	12	20	30	40	—	—

(3) *Extraneous material.* An instance of extraneous material refers to an occurrence or group of occurrences of extraneous material in a scallop. Extraneous material consists of sand, grit, intestines, seaweed and substances foreign to the scallop meat, except for shell fragments.

(4) *Piece of shell fragment.* The presence in the scallops of any fragment of the scallop shell regardless of size.

(b) For the purpose of rating the factor of absence of defects the schedules of deduction points in Tables III and IV apply.

§ 270.17 Character.

(a) Character refers to the texture of the scallop meat and of the coating and the presence of gristle in the cooked state. Deduction points are based on the degree of variation in the texture attributes of the coating and scallop meat or the relationship between the number of instances and the number of scallops within the package.

(1) *Gristle.* An instance of gristle refers to an occurrence of the tough elastic tissue usually attached to the scallop meat.

(2) *Texture* refers to the firmness, tenderness, and moistness of the cooked scallop meat and to the crispness and tenderness of the coating of the cooked product. The texture of the scallop meat may be classified as a degree of mushiness, toughness, and fibrousness. The texture of the coating may be classified as a degree of pastiness, toughness, dryness, mushiness, or oiliness.

TABLE V—SCHEDULE OF POINT-DEDUCTIONS FOR CHARACTER SUBFACTOR OF TEXTURE

Character subfactors	Method of determining subfactor score	Deduction points
Texture in the cooked state	<i>Texture of the coating</i>	
	Firm or crisp but not tough, pasty, mushy, or oily.....	0
	Moderately tough, pasty, mushy, or oily.....	5
	Excessively tough, pasty, mushy, or oily.....	15
	<i>Texture of the scallop meat</i>	
	Firm, but tender and moist.....	0
	Moderately tough, dry, and/or fibrous or mushy.....	5
	Excessively tough, dry, and/or fibrous or mushy.....	15

TABLE VI—SCHEDULE OF POINT-DEDUCTIONS FOR CHARACTER SUBFACTOR OF GRISTLE

Number of scallops per 7 ounces	Number of instances of gristle								
	0	1	2	3	4	5	6	7	8 or more
	Point deductions								
10 or less.....	0	2	4	6	8	10	12	14	16
11.....	0	2	4	6	8	10	12	14	16
12.....	0	2	4	6	8	10	12	14	16
13.....	0	1	3	5	8	10	12	14	16
14.....	0	1	3	5	8	10	12	14	16
15.....	0	1	2	4	6	8	10	12	14
16.....	0	1	2	4	6	8	10	12	14
17.....	0	1	2	4	6	8	10	12	14
18.....	0	1	2	4	6	8	10	12	14
19.....	0	1	2	4	6	8	10	12	14
20 or more.....	0	1	2	4	6	8	10	12	14

(b) For the purpose of rating the factor of character, the schedules of deduction points in Table V and VI apply. Frozen fried scallops which receive 15 deduction points for the factor of character shall not be graded above Sub-standard regardless of the total score for the product. This is a limiting rule.

DEFINITIONS AND METHODS OF ANALYSIS

§ 270.21 Definitions and methods of analysis.

(a) *Percent of scallop meat* refers to percent, by weight, of scallop meat in a sample as determined by the following method:

$$\text{Percent scallop meat} = \frac{\text{Weight of scallop meats (iv)}}{\text{Weight of frozen fried scallops (i)}} \times 100$$

(1) *Equipment needed.* (i) Water bath (3 to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch with second hand.

(v) Paper towels.

(vi) Spatula, 4-inch blade with rounded tip.

(2) *Procedure.* (i) Weigh all scallops in the sample while still in a hard frozen condition.

(ii) Place each scallop individually in the water bath which is maintained at 63° to 86° F. and allow the scallop to remain until such time as the breeding becomes soft and can easily be removed from the still frozen meat (between 10 to 30 seconds for scallops held in storage at 0° F.).

Note: Several dry runs are necessary to determine the exact dip time required for "debreeding" the scallops in a lot sample. For dry runs only, a saturated solution of copper sulfate (500 grams of copper sulfate in 2 liters of tap water) is necessary. The correct dip time is the minimum time required to dip the scallops in the (copper sulfate) solution so that the breeding can

easily be scraped off; provided that (1) the "debreeding" scallop is still solidly frozen, and (2) only a slight trace of blue color is visible on the surface of the "debreeding" scallop meat.

(iii) Remove the scallop from the bath; blot lightly with double thickness paper toweling; and scrape off or pick out coating from the scallop meat with the spatula or nut picker.

(iv) Weigh all "debreeding" scallop meats.

(v) Calculate the percent of scallop meat in the sample by following formula:

(b) *Cooked state.* Cooked state shall mean that the product shall be cooked in accordance with the instructions accompanying the product. If specific instructions are lacking, the product for inspection shall be cooked as follows: Spread the frozen scallops on a foil covered baking sheet or a shallow pan. Place sheet or pan and frozen contents at the mid point of a properly ventilated oven pre-heated to 400 degrees Fahrenheit until thoroughly cooked, 15 to 20 minutes.

(c) *Definitions.* (1) "Moderate" refers to a scored condition that is readily noticeable but is not seriously objectionable.

(2) "Excessive" refers to a condition that is very noticeable and is seriously objectionable.

(3) "Instance" refers to an occurrence of an individual scored subfactor on a scallop.

LOT CERTIFICATION TOLERANCES

§ 270.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 260 of this chapter (Regulations Governing Processed Fishery Products, Vol. 25 F.R. 8431, Sept. 1, 1960.)

Note: See *Commercial Fisheries Review*, September 1961 p. 112.

FEDERAL STANDARD PROPOSED FOR GRADES OF FROZEN FLOUNDER AND SOLE FILLETS:

A proposed voluntary standard for grades of frozen flounder and sole fillets was announced in the January 5, 1962, Federal Register. The proposed standard, if made effective, will be the first issued by the Department of the Interior prescribing Government standards for these types of fillets.

Description of the product: Frozen flounder and sole fillets consist of clean, wholesome fillets processed and frozen in accordance with good commercial practice and maintained at temperatures necessary for their preservation. The fillets may be cut transversely or longitudinally into subunits. This standard does not provide for the grading of portions or units cut from previous frozen fish blocks, slabs, or similar material.

The product covered by this standard is prepared from the following species only:

Sole:

- Dover sole (*Microstomus pacificus*)
- English sole (*Parophrys vetulus*)
- Gray sole (*Glyptocephalus cynoglossus*)
- Petrale sole (*Eopsetta jordani*)
- Lemon sole (*Pseudopleuronectes americanus*, over 3½ pounds)
- Rock sole (*Lepidopsetta bilineata*)
- Sand sole (*Psettichthys melanostictus*)

Flounder:

- Blackback (*Pseudopleuronectes americanus*, less than 3½ pounds)
- Yellowtail flounder (*Limanda ferruginea*)
- Dab, plaice (*Hippoglossoides platessoides*)
- Fluke (*Paralichthys dentatus*)
- Starry flounder (*Platichthys stellatus*)

A number of styles are described. Style I consists of solid pack where the fillets are frozen together. This style is subdivided into: A--fillets packed into a single solid block, and B--fillets packed and frozen with separators into smaller weight units. Style II consists of individually-quick-frozen fillets.

As published, the proposed standard describes the product, styles of pack, grades, determination of the grade, definitions, and tolerances for certification of officially drawn samples.

Interested persons had until February 4, 1962, to submit written comments, suggestions, or objections on the proposed standard.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

USE OF SODIUM NITRATE IN SMOKED CURED SHAD:

A further extension to January 1, 1963, permitting the use of sodium nitrate under specified conditions in the curing of shad was announced by the U. S. Food and Drug Administration in the Federal Register of December 30, 1961. The extension and use was granted under the Federal Food, Drug, and Cosmetic Act as amended. The limit is 200 p.p.m. expressed as nitrite. The notice indicates that a progress report is required by July 1, 1962, on the research studies to determine the safety of the specified process.

The order was incorporated in the regulations under "Part 121--Food Additives, subpart A, section 121.90."



Department of the Treasury

COAST GUARD

AUTHORIZED TO INTENSIFY OCEANOGRAPHIC STUDIES:

With the U. S. Coast Guard authorized to continue and intensify its oceanographic studies, United States, efforts to probe the secrets of the sea were given new impetus. The Coast Guard's long experience in the field of oceanography which extends over nearly a century was recognized when the Coast Guard Oceanography Bill (H. R. 6845) was signed by President Kennedy on October 5 as Public Law 87-396. This permits the Coast Guard to carry out its oceanographic research without restriction and under formal sanction of the United States Government.

Practical effect of the new authority will be to permit the Coast Guard to expand the range and effectiveness of its oceanographic program. At present, four ocean stations in the Atlantic and two in the Pacific are maintained the year-around. A total of 36 major cutters are involved at various times. With equipment such as precision depth recorders, oceanographic winches, and salinometers,



Fig. 1 - Under the new Coast Guard Oceanography law, major Coast Guard cutters may be more adequately equipped to provide a wider range of information about the sea and air than they now do. Affected will be such vessels as the 255-ft. class, represented here by the Androscoogin, which have regularly served other agencies and organizations as testing platforms for oceanographic and hydrographic research while manning ocean stations and performing other duties at sea.

they will add much information to the soundings, sea and swell observations, fish, bird and other wildlife counts, sea temperatures at different depths, drift bottle casts, plankton samplings, and water and air samplings they are now providing.

The new offshore light stations the Coast Guard is now building to replace most of its lightships, have already been designed for measurement of tides, waves, coastal current, and air-sea boundary processes. This will be in addition to their regular duties of aiding navigation.

Eventually, additional Coastguardsmen will be trained in the operation and maintenance of measuring equipment and will gain the basic knowledge for taking accurate measurements.

In the past, the Coast Guard's contributions to oceanography have been considerable. It has a history and tradition in the marine sciences which goes back to 1867 when the Revenue Cutter Lincoln was dispatched to chart the waters surrounding the newly purchased territory of Alaska. The Bering Sea Patrol dating back to 1870 has made vast

contributions in exploring and charting Alaskan waters which are rich in fish and wildlife.

Coast Guard cutters have pioneered oceanographic surveys of the North American Arctic. The cruises of the Cutter Corwin in 1884, the Marion in 1931, the Chelan in 1937 and the Northland in 1938-39 stand as mileposts of United States efforts in the Arctic.

Coast Guard oceanographic work falls into two categories: (1) oceanographic research in support of the International Ice Patrol, and (2) work performed for other agencies and organizations. A large part of Coast Guard oceanographic work is done in connection with its International Ice Patrol.



Fig. 2 - A large part of U. S. Coast Guard oceanographic research has been done in connection with its role of conducting the International Ice Patrol. Here aboard the specially-equipped Coast Guard oceanography cutter Evergreen trained personnel record temperatures of water samples collected in Nansen bottles from some of the 475 selected stations the cutter occupies during her iceberg season and post-season surveys in the West Greenland Current, Labrador Sea, and Baffin Bay.

For 47 years, in order to find out more about the conditions that spawn North Atlantic Icebergs, specially equipped cutters like the present-day Evergreen, have conducted oceanographic surveys in the Labrador Current and the Gulf Stream off the Grand Banks of Newfoundland. Post-iceberg season oceanographic cruises are made in the West Greenland Current, Labrador Sea, and across Baffin Bay. At present, approximately 475 hydrographic stations are occupied in these regions each year. Temperature and salinity measurements are made to depths of 5,000 feet. Surface and subsurface currents are measured. After the data are processed both aboard the research vessel and later back at

Woods Hole, Mass., a complete report is published once each year.

The International Ice Patrol oceanographic program has served as a cornerstone for American Oceanographic practices. Some of the highlights are: (1) the determination of ocean currents by dynamic topography in 1921, (2) development of the salinometer in 1926, (3) use of the geomagnetic current meter in 1948, (4) airborne radiometry in 1954, (5) and in the 1961 season, three deep-sea oceanographic buoys in the Labrador Sea. The Patrol's work is mature enough to have reaped the rewards of its own research. In the words of the late world renowned oceanographer, Harold Sverdrup, former director of the Scripps Institution "The work of the Coast Guard is the outstanding example of practical application of the methods of computing ocean currents."

In cooperating with agencies, Coast Guard ships collect about 26,000 bathythermograph observations a year. Seven lightships in addition to bathythermograph observations, collect water samples and make other observations for various research organizations. As part of Navy resupply operations in the Arctic and Antarctic, the Coast Guard icebreakers Eastwind, Northwind, and Westwind make many valuable contributions.

The Eastwind on her return from the 1960 Antarctic Operation DEEPFREEZE, transited the Indian Ocean. She completed some 30 oceanographic stations as a contribution to the Indian Ocean Expedition under the coordination of the National Science Foundation and cooperation of the Hydrographic Office.

The icebreaker Northwind commenced American oceanographic studies in Antarctica following World War II and in the fall of 1960 conducted an oceanographic cruise of Alaskan and Siberian Seas. Her performance in routinely occupying 105 oceanographic station in those regions at such a late season is attested to by the U. S. Navy commendation which states "a feat unequalled by any icebreaker."

A total of 45 Coast Guard vessels routinely supply the Navy Hydrographic Office with approximately 360,000 miles of bathymetric surveys each year.

The new law is a result of the President's urgings to Congress stressing the importance of developing our knowledge of the oceans. He has stated that our very existence may hinge

upon this knowledge. Besides advantages to our military forces, more knowledge of the oceans may make available a wealth of nutritional and mineral resources, and help predict or perhaps someday control the weather.

With the new clearcut authority for the Coast Guard to engage in oceanographic research, development of an increased well-planned program is now possible. The Coast Guard will contribute its part towards helping the United States cross the threshold of our knowledge of the oceans.



Eighty-Seventh Congress

(Second Session)

CONGRESS RECONVENES: The second session of the 87th Congress convened January 10, 1962. The first session adjourned September 27, 1961. All legislation before the House and Senate during the first session remained in its status as of adjournment and is subject to further consideration during this second session. Bills introduced in the first session do not have to be reintroduced. Bills reported out of a committee or passed by one body of Congress remain in status quo and do not have to retrace legislative steps during the second session.



BUDGET OF THE UNITED STATES: H. Doc. No. 266, The Budget of the United States Government for the Fiscal Year Ending June 30, 1963, 87th Congress, 2nd Session, 1,171 pp., printed. (For sale by the Superintendent of Documents, Washington 25, D. C., for \$6.00.) The budget as submitted Jan. 18, 1962, to the Congress, provides increases in budget estimates for the Fish and Wildlife Service. For the Office of the Commissioner \$364,000--the same as in 1962. Estimates for Bureau of Sport Fisheries and Wildlife total \$68,610,000 as compared with \$62,153,000 in 1962. Increases are proposed in management and investigations of resources, construction, general administrative expenses, and grants to states and local governments under permanent authorizations. The 1963 budget estimates for the Bureau of Commercial Fisheries total \$35,418,000 as compared to \$32,657,000 for fiscal 1962. Management and investigations of resources

would be increased to \$20,115,000 from \$17,506,000 in fiscal 1962; total construction would amount to \$8,414,000 as compared to \$8,600,000 in 1962; general administrative expenses would be increased to \$983,000 as compared to \$849,000 in 1962; Administration of Pribilof Islands would be \$1,998,000 as compared to \$1,981,000 in 1962; payment to Alaska from Pribilof Islands fund \$622,000 as compared with \$537,000 in 1962; Fisheries Loan Fund would be increased to \$2,505,000 as compared with \$2,414,000 in 1962. Construction of fishing vessels (fishing vessel construction differential subsidy) remains the same as 1962 at \$750,000. Total amount of the estimates for the Fish and Wildlife Service is \$104,392,000, compared to \$95,174,000 in 1962.

FISH AND WILDLIFE AID THROUGH EQUIPMENT TRANSFER: H.R. 9527 (McIntire) introduced in House Jan. 10, 1962; to provide that surplus property of the United States may be donated to the states for the promotion of fish and wildlife management activities, and for other purposes; to the Committee on Government Operations. Similar to other bills introduced in First Session.

FISH AND WILDLIFE LEGISLATION: Miscellaneous Fish and Wildlife Legislation (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-Seventh Congress, First Session), 289 pp., printed. Contains hearings on H.R. 206, to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes; H.R. 682, relating to documentation and inspection of vessels of the United States; H.R. 777, for the protection of marine mammals on the high seas, and for other purposes; H.R. 2894 and S. 606, to provide for the construction of a shellfisheries research center at Milford, Conn.; H.R. 3159, to permit certain foreign-flag vessels to land their catches of fish in the Virgin Islands in certain circumstances, and for other purposes; H.R. 3788, to provide for the transfer of the United States vessel Alaska to the State of California for the use and benefit of the Department of Fish and Game of such state; and H.R. 1171, to increase the public benefits from the national fish and wildlife conservation areas through their incidental or secondary use for public recreation, and for other purposes.

FISH HATCHERY: H.R. 9623 (Evins) introduced in House Jan. 11, 1962; to establish, construct, equip, operate, and maintain a fish hatchery in Clay County, Tenn.; to the Committee on Merchant Marine and Fisheries. Similar to other bills on same subject.

PRESIDENT'S STATE OF THE UNION MESSAGE: The President on Jan. 11 delivered his State of the Union Message (H. Doc. No. 251) to a joint session of Congress. Under the subject of "Agriculture and Resources," the President stated: "We also need for the sixties--if we are to bequeath our full national estate to our heirs--a new long-range conservation and recreation program--... new starts on water and power projects as our population steadily increases--... ." On the subject of "Trade," the President stated: "Above all, if we are to pay for our commitments abroad, we must expand our exports... But the greatest challenge of all is posed by the growth of the European Common Market. Assuming the accession of the United Kingdom, there will arise across the Atlantic a trading partner behind a single external tariff similar to ours with an economy which nearly equals our own. Will we in

this country adapt our thinking to these new prospects and patterns--or will we wait until events have passed us by?

"...I shall shortly send to the Congress a new 5-year trade expansion action, far reaching in scope but designed with great care to make certain that its benefits to our people far outweigh any risks. The bill will permit the gradual elimination of tariffs here in the United States and in the Common Market on those items in which we together supply 80 percent of the world's trade--mostly items in which our own ability to compete is demonstrated by the fact that we sell abroad, in these items, substantially more than we import. This step will make it possible for our major industries to compete with their counterparts in Western Europe for access to European consumers.

"On the other hand, the bill will permit a gradual reduction of duties up to 50 percent--permit bargaining by major categories--and provide for appropriate and tested forms of assistance to firms and employees adjusting to import competition. We are not neglecting the safeguards provided by peril points, an escape clause, or the national security amendment. Nor are we abandoning our non-European friends or our traditional most-favored-nation principle..."

SALMON IMPORT RESTRICTIONS: H.R. 9547 (Pelly) introduced in House Jan. 10, 1962; to facilitate the application and operation of the Fish and Wildlife Act of 1956; to the Committee on Merchant Marine and Fisheries. The bill would prohibit the import of salmon products derived from fish caught by nationals of any country that permits fishing for salmon by gill nets on the high seas at times and places where occur large quantities of immature salmon of North American origin. Also introduced in Senate, Jan. 18, 1962, S. 2707 (Magnuson), similar to House bill.

TRADE ADJUSTMENT ACT OF 1962: S. 2663 (Sparkman) introduced in Senate Jan. 11, 1962; to provide assistance to business enterprises and individuals to facilitate adjustments made necessary by the trade policy of the United States; to the Committee on Finance. The purpose is to offset the impact on American businesses, especially smaller businesses, of a more liberal national trade policy by a broad-gauge program of adjustment assistance. Eligibility would be determined by a new trade adjustment division in the Tariff Commission. Certificates of eligibility for assistance of import-affected businesses and workers would be issued. Business enterprises and workers who are adversely affected by the trade policy of the United States are eligible for assistance. Would amend the Trade Agreement Extension Act of 1961 with reference to

peril-point provisions, and escape-clause provisions to permit the Tariff Commission to recommend invocation of the Trade Adjustment Act as an alternative to a recommendation of an increase or of no decrease in existing customs treatment or import restrictions. Would create an interagency committee on trade adjustment to determine the kinds and amounts of assistance needed by those classes of business enterprises and workers found by the Tariff Commission to be eligible for the benefits provided by the act. Would authorize the President to invoke the Trade Adjustment Act as an alternative to increased or continued rates of duty. With respect to the powers and functions of the President on the peril-point and escape-clause provisions of the Trade Agreement Extension Act of 1951, would authorize him, in either case, to invoke trade adjustment rather than continued or increased rates and types of protection. Would have the business concern which the Tariff Commission has certified to be eligible for the benefits of the act apply to the Small Business Administration for technical advice and assistance. Would also empower the SBA to grant trade adjustment loans. Would authorize SBA to make grants up to \$25,000 to eligible business enterprises for procuring technical assistance in the private business community, to make detailed plans for their adjustment to changed conditions and to new lines, when a need to do so has been occasioned by the trade policy of the United States. Would permit SBA to make all of its programs authorized under the Act available to all certified eligible businesses not dominant in their lines, whether or not they are technically small businesses. Would amend section 4 (c) of the Small Business Act to increase the authorized appropriation to the section 7 (b) revolving loan fund by \$100 million, the entire amount of the increase to be earmarked for the new trade adjustment loan program. Would include an unemployment assistance program as well as training and transportation provisions for workers; provisions for retirement of eligible workers under Social Security age 60; also accelerated amortization. Also introduced in House: H.R. 9741 (Multer) January 18, 1962, H.R. 9806 (Miller) Jan. 22, 1962, and H.R. 9846 (Patman) Jan. 23, 1962; all similar to Senate bill.

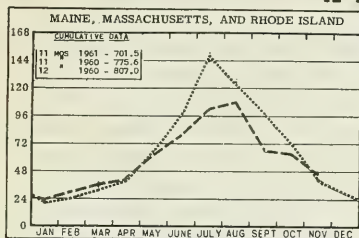
TRADE AGREEMENTS ACT OF 1961: H.R. 9504 (Chelf) introduced in House Jan. 10, 1962; to protect the domestic economy, promote the national defense and regulate the foreign commerce of the United States by adjusting conditions of competition between domestic industries and foreign industries, and for other purposes; to the Committee on Ways and Means. Somewhat similar to S. 2663 cited as the Trade Adjustment Act of 1962 but with substantial differences. H.R. 9504 is cited as the Trade Agreements Act of 1961.



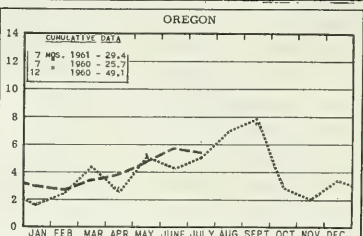
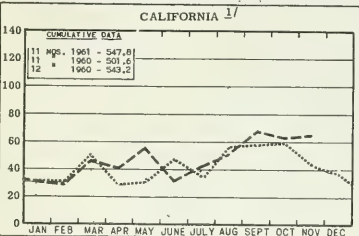
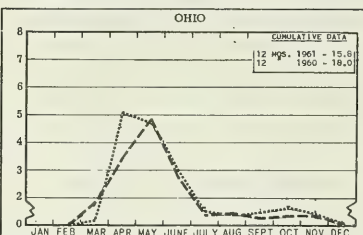
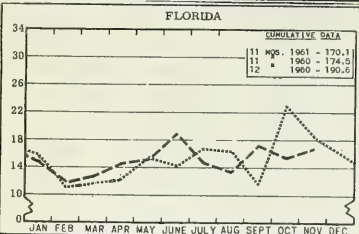
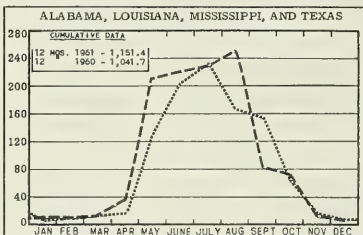
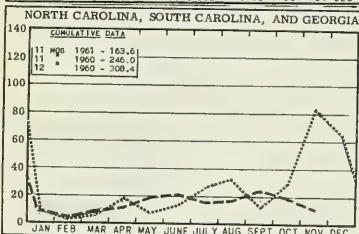
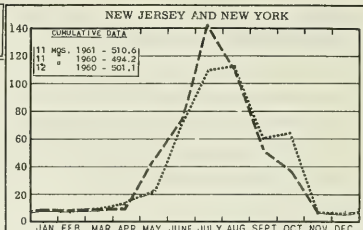
FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds



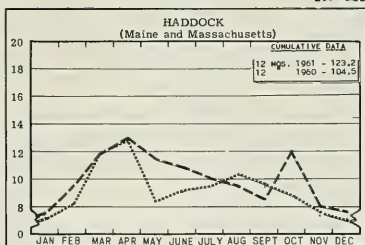
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— 1961
- - - 1960



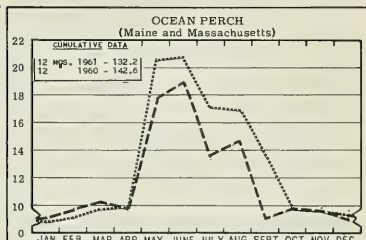
1/ ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

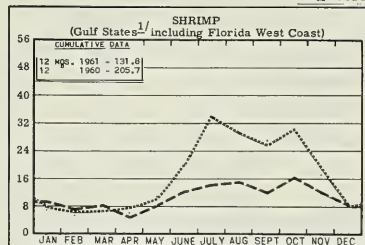
In Millions of Pounds



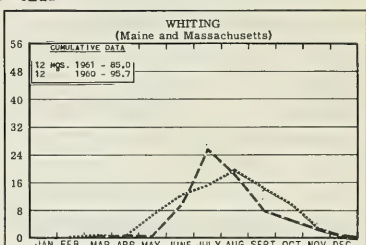
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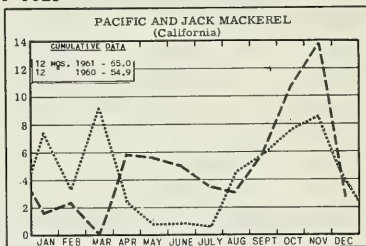
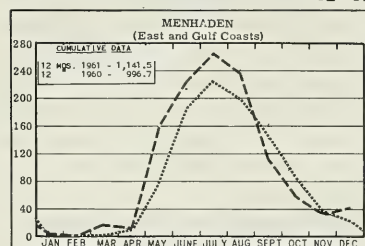
In Millions of Pounds



^{1/4}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



In Thousands of Tons



In Thousands of Tons

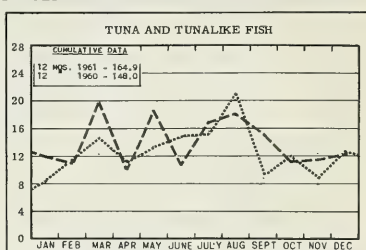
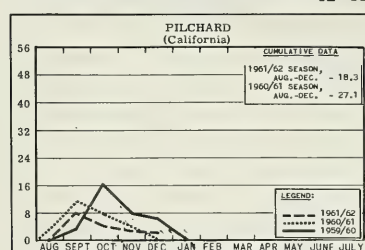
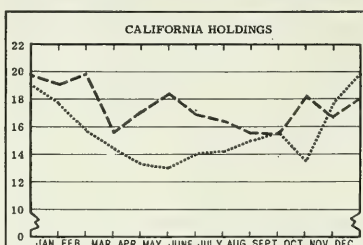
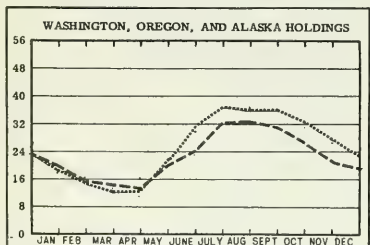
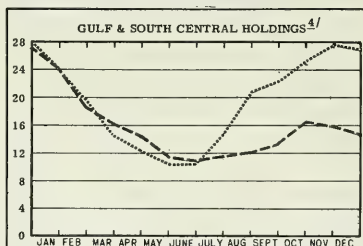
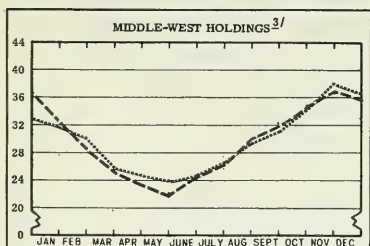
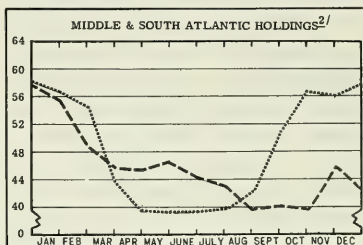
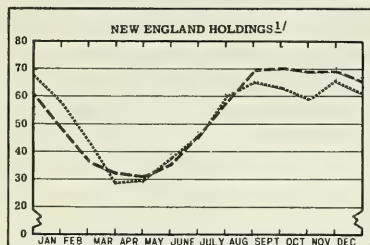
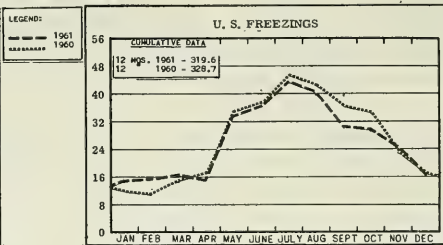
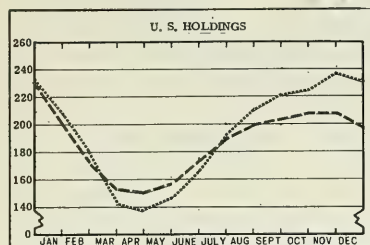


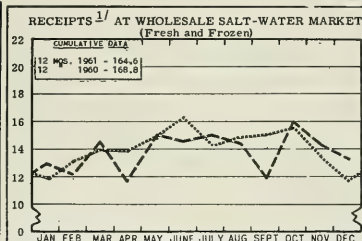
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS * In Millions of Pounds



* Excludes salted, cured, and smoked products.

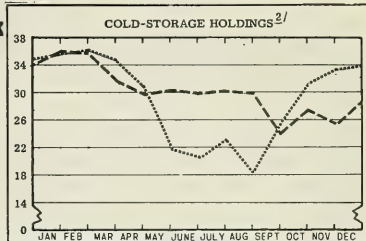
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

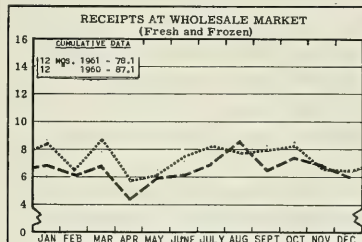


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

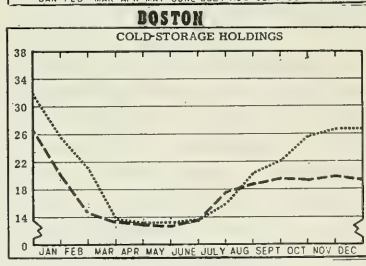
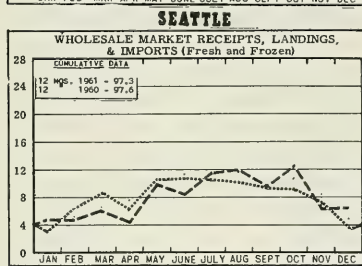
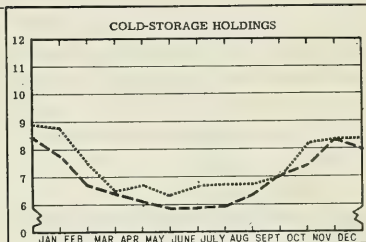
NEW YORK CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
— 1961
--- 1960

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

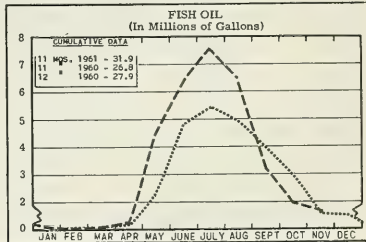
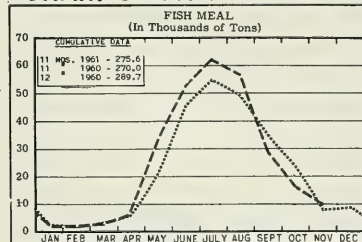
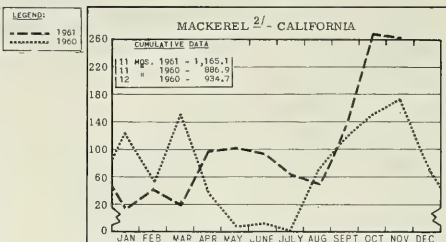
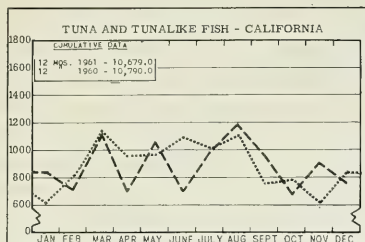
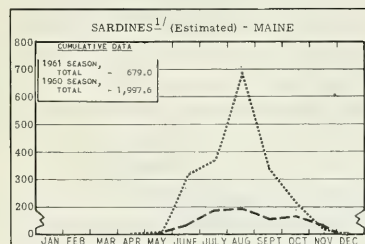
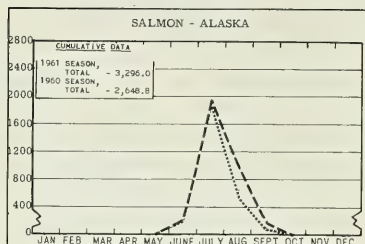
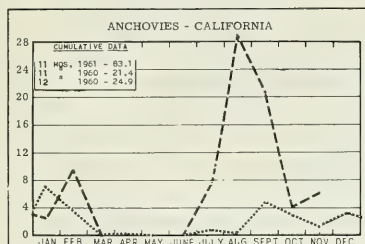


CHART 6 - CANNED PACKS of SELECTED FISHFRY PRODUCTS

In Thousands of Standard Cases



^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	$3\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	$\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.

^{1/} INCLUDING SEA HERRING.

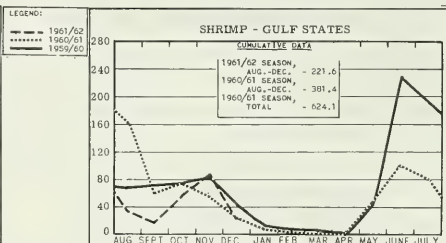
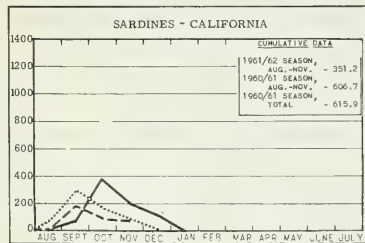
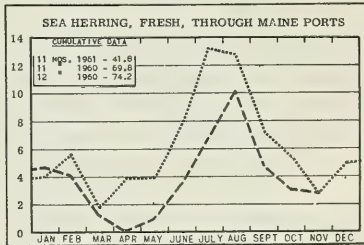
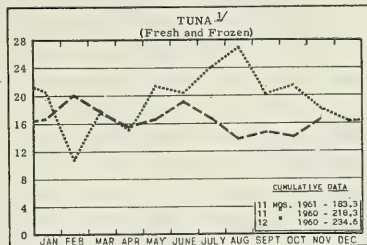
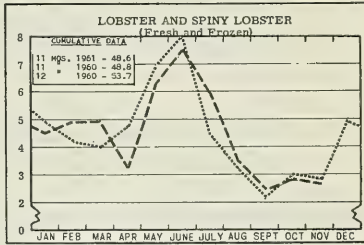
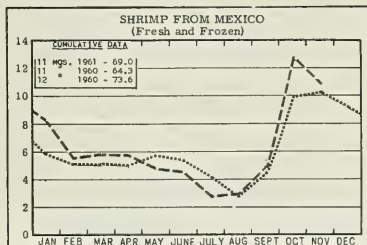
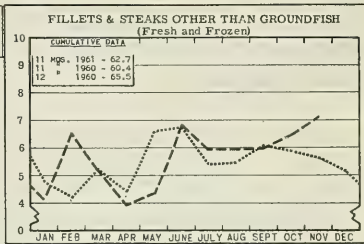
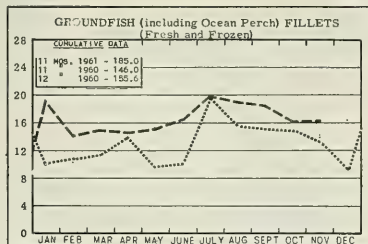
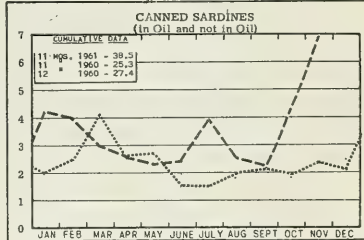
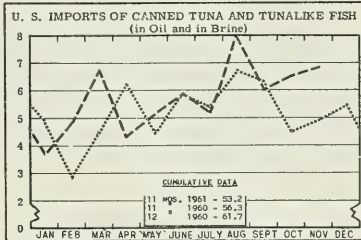


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/2} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
WNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|--------------------------------------------------------|
| CFS-2566 | Middle Atlantic Fisheries, 1960, Annual Summary, 8 pp. |
| CFS-2723 | Alaska Fisheries, 1960, Annual Summary, 8 pp. |
| CFS-2724 | Hawaii Fisheries, 1960, Annual Summary, 4 pp. |
| CFS-2728 | Frozen Fish Report, October 1961, 8 pp. |
| CFS-2729 | Michigan Landings, September 1961, 2 pp. |
| CFS-2730 | Fish Meal and Oil, September 1961, 2 pp. |
| CFS-2731 | Florida Landings, September 1961, 9 pp. |
| CFS-2732 | Maine Landings, September 1961, 4 pp. |
| CFS-2733 | Alabama Landings, June 1961, 3 pp. |
| CFS-2734 | Alabama Landings, July 1961, 3 pp. |
| CFS-2735 | Maryland Landings, September 1961, 3 pp. |
| CFS-2736 | Louisiana Landings, June 1961, 2 pp. |
| CFS-2737 | Shrimp Landings, July 1961, 6 pp. |
| CFS-2738 | Virginia Landings, September 1961, 4 pp. |
| CFS-2739 | Mississippi Landings, August 1961, 2 pp. |
| CFS-2740 | Wisconsin Landings, September 1961, 2 pp. |
| CFS-2741 | Ohio Landings, September 1961, 2 pp. |
| CFS-2742 | Minnesota Landings, September 1961, 2 pp. |
| CFS-2743 | Rhode Island Landings, September 1961, 3 pp. |
| CFS-2744 | New York Landings, September 1961, 5 pp. |
| CFS-2745 | California Landings, July 1961, 4 pp. |
| CFS-2746 | Louisiana Landings, July 1961, 2 pp. |
| CFS-2749 | North Carolina Landings, October 1961, 4 pp. |
| CFS-2751 | Maryland Landings, October 1961, 3 pp. |
| CFS-2755 | South Carolina Landings, October 1961, 2 pp. |
| CFS-2756 | Florida Landings, October 1961, 8 pp. |

FL-520 - Biology and Methods of Controlling the Starfish, *Asterias forbesi* (Desor), by Victor Loosanoff, 11 pp., illus., revised July 1961. A report on the starfish, one of the most destructive enemies of shellfish on the Atlantic coast of North America. Discusses the distribution and occurrence of

of starfish, their food and feeding, habits, mechanical and chemical methods of control, and utilization.

FL-521 - The Menhaden Fishery of the United States, by Fred C. June, 13 pp., illus., August 1961. This report describes the menhaden resource, reviews and describes the fishery, and gives a summary of the life history and biology of Atlantic menhaden.

FL-528 - How about the New Marine Oils, 8 pp., illus. This report answers three questions: What are Marine Oils, How are Marine Oils Produced, and How are Marine Oils Used?

SSR-Fish. No. 375 - New England Haddock Fishery Biostatistics--1956, by John R. Clark and Frank A. Dreyer, 87 pp., illus., April 1961. A statistical review of the haddock fishery of New England banks (Subarea 5 of the International Commission for the Northwest Atlantic Fisheries) for the 1956 haddock year. Estimates of total fishery removals are given for scrod and large haddock, both landed and discarded at sea, by month and area of capture. The estimated age and length compositions of the total haddock discard for 1956 are given. Age and length compositions are estimated by months for haddock landed from Georges Bank and by season for haddock landed from Gulf of Maine. Also the fishing effort and abundance estimates are given for Georges Bank by months.

SSR-Fish. No. 377 - North Pacific and Bering Sea Oceanography, 1959, by Felix Favorite and others, 216 pp., illus., processed, May 1961.

SSR-Fish. No. 378 - Drift Bottle Records for the Gulf of Maine, Georges Bank and Bay of Fundy, 1956-58, by Dean F. Bumpus, 128 pp., illus., May 1961.

SSR-Fish. No. 380 - Water Temperatures off the South Atlantic Coast of the United States--Theodore N. Gill Cruises 1-9, 1953-54, by William W. Anderson, Joseph E. Moore, and Herbert R. Gordy, 212 pp., ill., May 1961.

SSR-Fish. No. 388 - Tolerance of Striped Bass and American Shad to Changes of Temperature and Salinity, by Marlin E. Tagatz, 8 pp., August 1961.

SSR-Fish. No. 391 and 392 - Effects of DDT Spray on Fish and Aquatic Insects in Gallatin River Drainage in Montana, by W.R. Bridges and Austin K. Andrews; and Effects of DDT Spray on Stream Bottom Organisms in Two Mountain Streams in Georgia, by Paul J. Frey, 14 pp., illus., August 1961.

Sep. No. 635 - Principal Species of Commercial Shrimp in Argentina.

Sep. No. 636 - Exploratory Fishing off the Coast of North Carolina, September 1959-July 1960.

Sep. No. 637 - Soft-Crab Industry.

Sep. No. 638 - North Pacific Fishery Research Vessels.

Fisheries Loan Fund, Fiscal Year 1960, Circular 123, 8 pp., illus., processed, 1961. Discusses the Bureau of Commercial Fisheries loans and grants activities, status of the fishery loan fund, and use of proceeds of loans. Includes graphs showing number of loan applications, value of applications, and other similar data.

Galveston Biological Laboratory Fishery Research, (Fiscal Year 1961), Circular 129, 85 pp., illus., July 1961. Summarizes the research work carried out at the Galveston Biological Laboratory during the fiscal year ended June 30, 1961. Describes in detail the research programs on the shrimp fishery, industrial fishery, estuarine, physiology and pesticide, and red tide. Also includes special reports on the sea-water system, oyster studies, and distribution of pink shrimp larvae and postlarvae.

The Pacific Region of the Bureau of Commercial Fisheries, by Thomas O. Duncan, Fish and Wildlife Circular 108, 17 pp., processed. Discusses the activities of the Pacific Region of the U.S. Bureau of Commercial Fisheries, which range from basic research on the populations of fish and the many factors influencing their abundance, to the product on the consumer's table. Between these extremes, the Bureau's work involves various types of problems in many fields of science and technology.

Progress in 1960, Circular 127, 31 pp., illus. This report summarizes scientific accomplishments for the year 1960 and plans for the future for the Bureau of Commercial Fisheries Biological Laboratory at Honolulu. Discusses briefly the Laboratory's research on oceanography, marine biology, etc.

Research Program of the Ichthyological Laboratory, Circular 124, by Daniel M. Cohen, 8 pp., processed. Discusses the program of the Ichthyological Laboratory, its objectives, problems, solutions, and future plans.

Sharks, Skates, Rays, and Chimaeras, by J. R. Thompson and Stewart Springer, Circular 119, 19 pp., illus., processed. A general introduction to the class Chondrichthyes (sharks, skates, rays, and to a lesser extent, chimaeras). Material included encompasses, in broad terms, characteristics of the class and of its components. General statements on reproduction, numbers and general distribution, size, food and feeding, sensory perception, structural adaptations to specific modes of life, and relation to man are included. A short annotated list of references directs the reader to more specific and detailed sources for further study.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE
BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S.
FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-62	- Centolla (King Crab) Industry, Punta Arenas-Provenir, Chile, July 1961.

MNL-63 - Annual Report on Egyptian Fisheries, 1960.
MNL-64 - Fish Body Oil Markets in France.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, October 1961, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tuna-like fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, October and November 1961, 14 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings. Production and Shipments of Fishery Products, October and November 1961, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, October, 1961, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports

and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Providentown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New England Sea Scallop Fishery, and Marketing of Sea Scallop Meats, 1939-60, by John J. O'Brien, 48 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) A special report on the sea scallop fishery of New England and the marketing of sea scallop meats (domestic and foreign). Summarizes all the pertinent data scattered through many Market News Service reports and other publications during the period (1939-1960), which goes back to the first complete year of operation of the Boston Fishery Market News Service. Included in the report is a brief analysis of the trends in the 1939-60 period, and the important developments that affected the New England sea scallop fishery and industry. Also relates some of the history of the fishery. It includes data on landings and ex-vessel prices of the sea scallop fishery in New England; primary wholesale prices, imports, stocks, market trends, receipts on some wholesale markets, and some retail prices for sea scallop meats. Also includes landings and ex-vessel prices in some competitive ports.

New York City's Wholesale Fishery Trade--Monthly Summary--August 1961, 24 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesaler's selling prices for fresh frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October and November 1961, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of other-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF.:

The Study on the Color of the Fishing Net. III--Effect of the Depth of Color of a Net on the Behavior of a

Fish School Near the Net, by Kenji Kanda, and others. Translation Series No. 3, 4 pp., processed, November 1961. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 10, p. 621-624, 1958.)

Summary of Observations on Oyster Setting in Long Island Sound during the Summer of 1961, by V. L. Loosanoff, vol. 25, Bulletin No. 9, December 11, 1961, 9 pp., illus., processed. (Biological Laboratory, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Milford, Conn.) The report discusses the number and location of observation and sampling areas, operation of the spat collectors, procedure followed in observations, and analysis of findings. Included are illustrations and statistical tables showing results of sampling at the various stations.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Blood Properties of Prespawning and Postspawning Anadromous Alewives (Alosa pseudoharengus), by Carl J. Sindermann and Donald F. Mairs, Fishery Bulletin of the Fish and Wildlife Service, vol. 61, 11 pp., illus., printed, 15 cents, 1961.

Effects of Copper Ore on the Ecology of a Lagoon, by Kenneth T. Marvin, Lawrence M. Lansford, and Ray S. Wheeler, Fishery Bulletin 184 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 12 pp., printed, 15 cents, 1961.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"Photosensitization of Animals by the Viscera of Abalones, *Haliotis* Spp.," by Yoshiro Hashimoto, Koji Naito, and Junzo Tsutsumi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, December 1960, pp. 1216-1221, printed in Japanese and English. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ALGAE:

"A List of Marine Algae Collected in the Vicinity of Oshoro Marine Biological Station, at Oshoro, Hokkaido, Japan," by Jun Tokida and Tomitaro Masaki, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, November 1959, pp. 173-195, printed in Japanese. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"On a New Amino Acid (Chondrine) Isolated from Red Alga *Chondria crassicaulis*," by Mitsuo Kuriyama, Mitsuzo Takagi and Kiichi Murata, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, June 1960, pp. 627-631, printed in Japanese with English summary. Japanese Society of Scientific

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ANIMAL NUTRITION:

"The Effect of Unidentified Growth Factor Sources and Restricted Feeding on the Performance of Egg Strain Chickens," by W. F. Pepper, S. J. Slinger, and G. C. Ashton, article, *Poultry Science*, vol. 40, p. 588, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

ANTIOXIDANTS:

"Estimation of Antioxidants Added to Marine Products. I--Extraction and Colorimetric Estimation of BHA (Butylated Hydroxyanisole)," by Kenzo Toyama, Michio Nakai and Hiroshi Yamaga, article, *Nippon Suisan Gakkaishi*, vol. 25, 1959-1960, pp. 212-217, printed, *Chemical Abstracts*, vol. 54, No. 15737e, August 10, 1960.

BACTERIOLOGY:

"Detection and Enumeration of Fecal Indicator Organisms in Frozen Sea Foods. I--*Escherichia Coli*," by H. Raj and J. Liston, article, *Applied Microbiology*, vol. 9, March 1961, pp. 171-174, printed. Applied Microbiology, Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md.

BAIT:

"Study on the Bait for Fishing. Part I--An Improved Type of Chum for Yellowtail Fishing," by Takashi Kaneda, Takeo Koyama, and Seinosuke Ishii, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, June 1960, pp. 610-613, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BIOCHEMISTRY:

"Phosphoglucosomutase, Phosphoribomutase, and Phosphoglucosomerase of Lingcod Muscle," by Gerard-B Martin and H.L.A. Tarr, article, *Canadian Journal of Biochemistry and Physiology*, vol. 39, February 1961, pp. 297-308, printed. Canadian Journal of Biochemistry and Physiology, Division of Administration, The National Research Council, Sussex St., Ottawa, Canada.

BRAZIL:

A First Appraisal of the Landing and Mechanism of the Santos Fishery, by I. D. Richardson and M. N. de Moraes, 85 pp., illus., printed in English. Universidade de Sao Paulo, Sao Paulo, Brazil, 1960. (Reprinted from Boletim do Instituto Oceanografico, Tomo XI, Fasc. 1, pp. 5-86.) This paper summarizes and analyzes the landing data collected at Santos, Brazil, during the period July 1958-June 1959. These data are given in terms of weight landed of the more important fish and shrimp and also in terms of value. The distribution of the landings of each of the more important species is shown both according to the type of fishing gear used and fishing area. The fishing area is given in the form of statistical rectangles of 60 miles square. The landings are broken down to obtain a figure for the landing per hour of fishing for each species, for each gear, and for each rectangle fished. This figure of landing per unit fishing time is used to compare one area with another, one gear with another, and one month with another for each

of the important species. In this way, comparisons of the available density of a species by time, area, and fishing gear are made.

BROWNING OF FISH FLESH:

"Studies on the Browning of Fish Flesh. II--Change of Sugar Content by Heat Process and Browning," by Fumio Nagayama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, October 1960, pp. 1026-1031, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

CALIFORNIA:

The Ecology of the Salton Sea, California, in Relation to the Sportfishery, Fish Bulletin No. 113, 204, pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., 1961.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 18, no. 5, September 1961, pp. 645-891, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, the following articles: "Comparative Osteology of Representative Salmonid Fishes, with Particular Reference to the Grayling (*Thymallus arcticus*) and Its Phylogeny," by Carroll R. Norden; "Detection of Incomplete Reporting of Tags," by Gerald J. Paulik; "The Light Pickle Salting of Cod," by P. B. Crean; "The Partial Desalting of Salted Cod," by P. B. Crean; "Chemical Characteristics of Salted Cod," by A. E. Cardin and others; "Effect of Estradiol Monobenzoate on Some Serum Constituents of Maturing Sockeye Salmon (*Oncorhynchus nerka*)," by F. Chung-Wai Ho and W. E. Vanstone; "Fatty Alcohols from Marine Oils and Segregated Esters," by P. M. Janggaard and R. G. Ackman; and "Growth and Age Determination of the Pacific Edible Crab (*Cancer magister* Dana)," by T. H. Butler.

CATFISH:

"Catfishes," by Frank Schwartz, article, *Maryland Conservationist*, vol. 38, no. 5, September-October 1961, pp. 21-26, illus., printed. Maryland Department of Game and Fish, State Office Bldg., Box 231, Annapolis, Md. Describes catfish in general, then singles out the seven varieties found in various parts of Maryland, giving a description of each. Also covers briefly, the commercial catch of catfish, methods of catching them, and their spawning; and how to catch for sport, dress, and cook catfish.

CLAMS:

Operation Baby Clam in Florida, by Kenneth D. Woodburn, Contribution No. 58, 10 pp., illus., processed. Florida State Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla. The development of dependable techniques for laboratory culture of seed clams in quantity has spurred interest in the commercial potential of growing baby clams in Florida, where marketable sizes are reached sooner than in northern states. Hybrid and northern hard-shell baby clams are being grown in protective boxes along the Gulf and Atlantic coasts. It is hoped that, when the clams are large enough they can be placed on suitable bottoms, enclosed within screened frames and grown to marketable size.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COD:

Loss in Weight and Yield of Production after Gutting, Heading, and Filleting Cod on an Industrial Scale, by Jerzy Maciejczyk, OTS 60-21294, 15 pp., illus., processed, 1961. (Translated from Polish *Prace Morskiego Instytutu Rybackiego*, no. 9, 1957, pp. 681-703.) Office of Technical Services, Department of Commerce, Washington 25, D. C., at 50 cents each. Order by OTS number.

"IV. Observations on the Cod Trawl Fishery in the Gulf of St. Lawrence during the Spring of 1958," by John R. Clark and F. D. McCracken, article, *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, vol. 8, 1958, pp. 99-100, printed. International Commission for the Northwest Atlantic Fisheries, Forrest Bldg., Carleton St., Halifax, N. S., Canada.

"Slicing of Fillets as an Aid in Detection and Removal of Codworms from Atlantic Cod Fillets," by H. E. Power, article, *Journal of the Fisheries Research Board of Canada*, vol. 18, January 1961, pp. 137-140, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer & Controller of Stationery, Ottawa, Canada.

COMPOSITION:

"Fish Composition--Proximate Composition of Nine Species of Sole and Flounder," by Claude E. Thurston, article, *Agricultural and Food Chemistry*, vol. 9, no. 4, July-August 1961, pp. 313-316, printed. *Agricultural and Food Chemistry*, American Chemical Society, 1155 - 16th St. NW., Washington 6, D. C.

"Proximate Composition and Sodium and Potassium Contents of Four Species of Commercial Bottom Fish," by Claude E. Thurston, article, *Journal of Food Science (formerly Food Research)*, vol. 26, no. 5, 1961, pp. 495-498, printed. *Journal of Food Science*, Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

CUBA:

Estudio Bioquímico de la Langosta PANULIRUS ARGUS, I (Biochemical Study of the Spiny Lobster *Panulirus argus*, I), by Eduardo Peon Gonzalez, Note on Investigation No. 3, 64 pp., illus., printed in Spanish. Centro de Investigaciones Pesqueras, Playa Habana, Bauta, Cuba, August 1961.

Segunda Pesca Exploratoria y Datos Biológicos de la Langosta (PANULIRUS ARGUS) en Cuba (Second Exploration and Biological Data for Spiny Lobster, *Panulirus argus*, in Cuba), by Rene J. Buesa Mas, Contribution No. 12, 70 pp., illus., printed in Spanish. Centro de Investigaciones Pesqueras, del Departamento de Pesca del Instituto, Nacional de Reforma Agraria, Playa Habana, Bauta, Cuba, May 1961.

CURRENTS:

"Current Measurements from Moored Buoys," by W. S. Richardson, article, *Oceanus*, vol. 8, no. 2, December 1961, pp. 14-19, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass.

CUTTLEFISH:

"Biochemical Studies on the Viscera of Cuttlefish, *Ommastrephes sloani Pacificus*, V--On the Amylase and Esterase of Viscera," by Takashi Takahashi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, October 1960, pp. 1006-1009, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

DOLPHINS:

Dolphins: The Myth and the Mammal, by Antony Alpers, 268 pp., illus., by Erik Thorn, printed, \$5. Houghton Mifflin Co., 2 Park St., Boston 7, Mass.

ELECTRICAL FISHING:

"Considerations sur la Pêche au Moyen de l'Electricité" (Regarding Fishing by Means of Electricity), article, *France Pêche*, vol. 6, no. 54, September 1961, pp. 23-26, illus., printed in French. *France Pêche*, Tour sud-est, Rue de Guemene, Boite Postale 179, Lorient, France.

EXPORTS:

Preparing Shipments to the Republic of South Africa, WTIS Part 2, Operations Report No. 61-67, 8 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report giving information on the preparation of shipments for export to the Republic of South Africa. It covers the preparation of shipping documents, information on labeling and marking, customs procedures, and related subjects.

FEEDSTUFFS:

"Animal Body Meals as Protein Feedingstuffs," by H. J. Oslage, article, *Futter und Fütterung* (Supplement to *Der Tierzüchter*), vol. 12, 1961, pp. 44, printed in German. *Futter und Fütterung*, Schweinezucht und Schweinemast, Grazerstrasse, Hanover-Waldehausen, Zone 20, Germany.

FISH CULTURE:

Bamidgeh--Bulletin of Fish Culture in Israel, vol. 12, December 1960, 77 pp., illus., printed in English and Hebrew. *Bamidgeh--Bulletin of Fish Culture in Israel*, Fisheries Department, Ministry of Agriculture, Publication Division, Nir-David, D. N. Israel. Contains these articles: "Suggestions for the Improvement of Fish Breeding," by S. Tal; "New Substances for Control of Pymnesium," by S. Sarig and others; "An Electric Instrument for Brandmarking Fish," by Rom Moav and others; "Adaptability of *Tilapia nilotica* to Various Saline Conditions," by Ruth Lotan; "The Elimination of Uncontrolled Spawns in Carp Fattening Ponds," by J. Pruginin and J. Shechter; "A Mobile Belt for Hauling and Sorting Fish," by Z. Shatz.

FISH FLOUR:

"The Manufacture of Fish Flour in South Africa," by G. M. Dreosti and R. P. van der Merwe, *Fishing Industry Research Institute Progress Report* No. 64, article, The South African Shipping News and

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Fishing Industry Review, vol. 16, no. 8, August 1961, pp. 50, 63, and 65, printed. The South African Shipping News and Fishing Industry Review, Odhams Press, South Africa (Pty.) Ltd., Box 2598, Cape Town, South Africa. Discusses the history of fish flour in South Africa which started in 1937. Also discusses the technological aspects in the production of fish flour, such as type of fish, solvents, yield of fish flour, factors affecting rate of extraction, method of extraction and related subjects.

FISH MEAL:

"The Available Lysine Content of Fish Meals," by J. Olley and H. Watson, article, *Journal of the Science of Food and Agriculture*, vol. 12, 1961, p. 316, printed. *Journal of the Science of Food and Agriculture*, The Society of Chemical Industry, 14 Belgrave Square, London SW 1, England.

"Change of Nitrogenous Substances of Fish Meat in the Preparation of Meal," by K. A. Mrochov, article, *Rybnoe Khoziaistvo*, vol. 35, 1958, pp. 131-144, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

(FAO) International Meeting on Fish Meal, CL 35/LIM/3, 5 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 20, 1961.

"Feed Firm Study Shows Fish Meal Response," article, *Feedstuffs*, vol. 33, April 15, 1961, pp. 54, printed. *Feedstuffs*, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"Fish Meal," article, *Report for 1960 from Fiskeriministeriets Forsogslaboratorium*, p. 46, printed in Danish. Fiskeriministeriets Forsogslaboratorium, Copenhagen, Denmark.

"Fish Meal and Today's Feed Industry," by Herbert C. Davis, article, *Western Feed and Seed*, vol. 16, February 1961, pp. 25-26, printed. *Western Feed and Seed*, Western States Publications, 320 Market St., San Francisco 11, Calif.

"Fish Meal, Use as Food," by V. C. Metta, article, *Journal of the American Dietetic Association*, vol. 37, 1960, p. 234, printed. *American Dietetic Association*, 620 No. Michigan Ave., Chicago 11, Ill.

"Graded Levels of Herring Meal to Bacon Pigs, Effect on Growth Rate, Feed Efficiency, and Bacon Quality," article, *Journal of Agricultural Science*, vol. 56, 1961, p. 307, printed. *Journal of Agricultural Science*, Cambridge University Press, 200 Euston Rd., London NW1, England.

"Preservation of Caspian Sprat with Sodium Nitrate for the Manufacture of Fodder Flour," by N. A. Kulikov, article, *Rybnoe Khoziaistvo*, vol. 35, No. 10, 1959, pp. 65-68, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISH SCHOOLS:

"Studies on the Structure of Fish Shoals by Means of Fish Finder. I--Echo Patches of Hair-Tail Observed at the Middle Area of the East China Sea, in Feb-

ruary 1959," by Tsuneo Aoyama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, December 1960, pp. 1162-1166, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISH SOLUBLES:

"Fish Solubles Experiment Grows Grass on B.C. Highway," by T. Leach, article, *Canadian Fisherman*, vol. 48, no. 7, 1961, p. 36, printed. Canadian Fisherman, National Business Publications Ltd., Gardenvale, Quebec, Canada.

FOOD:

A Guide to the Selection, Combination, and Cooking of Foods, vol. 1 - Selection and Combination of Foods, by Carl A. Rietz, 411 pp., illus., printed, \$15.00 dom., \$16.00 for. The Avi Publishing Co., Inc., P.O. Box 388, Westport, Conn., 1961. Everyone partakes of food at least three times a day, but our knowledge about foods is very limited. The food behavior of man is the general subject of this book. One of the purposes of this book is to prove that good cooking is "simple." The author states that: "The vast majority of people feed. They do not eat." One of the cardinal premises of the book is that it is not possible for a person to qualify as a judge of food who does not know how to prepare it. The preface points out that cooking, though not an art, is a craft in which the arts have application. It involves discipline in the use of knowledge which has been furnished by many sciences. The more complete the scientific bases of a craft, the more perfect the craft; this generalization applies as well to cookery. Part I indicates a number of sciences which are directly connected with the science of food preparation. Familiarity with the rudiments of such subjects as biology, botany, chemistry, nutrition, pharmacology, physics, physiology, neurology, and psychology are basic for an epicurean cook. The chapters in Part I deal with educational requirements for culinary skills, anatomical and physiological limitations of man, interrelation of taste to other senses, and psychosomatics--what is involved in taste and flavor values. Part II deals with the "Gustametric Master Chart," its method, and its use in food selection. According to the preface, "all foods can be rated according to their flavor intensity, registered on a common logarithmic scaling system." The use of the chart makes it possible to determine quickly and exactly which combinations of foods make for agreeable meals. All types of foods and more than 600 individual foods are covered by the chart. It seems to me this is the first attempt ever made to determine what foods go together and to show a simple method of selecting combinations which are sure to please the average palate. Selection and combination of foods is placed on a scientific basis. In Part II there are chapters on aquatic food or fishery products, meat, poultry, dairy products, vegetables, fruits, beverages, herbs, spices, etc. The chapter on aquatic foods is quite comprehensive and includes sea plants, water fowl, and aquatic mammals. However, since frozen fishery products are increasing in importance, the lack of an extensive discussion on those products is noticeable. The appendix contains a chart on aquatic foods listing those foods according to their technical order and flavor rating intensity on a logarithmic scale. The appendix also includes sections on dry botanicals for beverages, relative sour-

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ness of foods, relative sweetness of wines, flavor appraisal, recommended procedures for packaging foods to be cooked for intrinsic flavor appraisal, and procedures in package cookery. The book has a good index. Anyone engaged in processing, handling, or studying foods will find a good deal of useful information in this book. Of course, anyone who is interested in food for eating pleasure will find the book a valuable addition to his personal library.

--Joseph Pileggi

FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries, Indexes to Supplement I, 29 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961. Contains geographic, taxonomic, subject, and citation indexes to references 570001-571944.

FRANCE:

"Les Problemes de la Peche Francaise Face au Marche Commun" (The Problems the French Fisheries Face in the Common Market), article, *France Peche*, vol. 6, no. 54, September 1961, pp. 39-48, illus., printed in French. *France Peche*, Tour sud-est, Rue de Guemene, Boite Postale 179, Lorient, France.

FREEZING:

"The Optimum Conditions for Freezing Fish in an Air Blast," by G. S. Konokotin, article, *Kholodil'nai Tekhnika*, no. 5, 1961, pp. 53-58, illus., printed in Russian. *Kholodil'nai Tekhnika*, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

FRESH-WATER FISH:

A Checklist of the Freshwater Fishes of Canada and Alaska, by W. B. Scott, 30 pp., printed. Royal Ontario Museum, Toronto, Canada.

FROZEN FOOD:

Handling and Merchandising Frozen Food, by F. Miles Sawyer, Thaddeus F. Midura, and Richard M. Vondell, 67 pp., printed. Food Distribution Program, Cooperative Extension Service, Stockbridge Hall, University of Massachusetts, Amherst, Mass., November 1960. A manual prepared to assist State Extension Service personnel in training programs to improve the handling and merchandising of frozen foods, including fish. Major emphasis has been devoted to retail handling. Minor treatment has been given to sections on processing, transportation, and warehousing to provide general background information.

GEAR:

"Top Chafing Gear Studies," by F. D. McCracken, article, *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, vol. 9, 1959, pp. 101-103, printed. *Annual Proceedings, International Commission for the Northwest Atlantic Fisheries*, Forrest Bldg., Carleton St., Halifax, N.S., Canada.

GENERAL:

Fishing News International, vol. 1, no. 1, October 1961, 1961, 120 pp., illus. printed, annual subscription £1 10s. (US\$4.75). *Fishing News International*, Arthur J. Heighway Publications, Ltd., 110 Fleet

St., London E. C. 4, England. This quarterly Journal is designed to form a link between the world's fishing industry and those whose task it is to further its development--the oceanographers, marine biologists, technical experts in catching, processing, distribution and management, and the numerous ancillary industries without whose products or services fishing would still be primitive. Will contain authoritative works on proper exploitation of the sea such as different aspects of marine science, modern vessel design and construction, equipment and machinery, reviews of catching techniques, advances and improvements in handling and processing on board, in factories, etc. This first issue contains a number of articles on the various aspects of commercial fisheries. Included are the following: "Science in Fisheries," by Editor in Chief, Arthur J. Heighway; "Freedom from Hunger," by D. B. Finn; "Preservation by Antibiotics, Part I," by H.L.A. Tarr; "International Conferences," "Fisheries of Mainland China," by E. F. Szezepanik; "Examination of Stern Trawling," by Conrad Birkhoff; "Common Policy in the Common Market," by P. Hovart; "Reorganizing Tunisia's Fishing Industry," by Mary R. Bull; "Handling of the Catch, Part I," by Jan F. Minnee; and "Accelerated Freeze Drying in Fish Processing," by Enid A. M. Bradford.

Life in the Sea, by Gosta Jagersten, photographs by Lennart Nilsson, 184 pp., printed, 50s. (US\$7.00), G. T. Foulis and Co., Ltd., London, England, 1961. A book of photographs, a few in color but mainly black-and-white, of marine invertebrates and a few fish.

A Report of Data Obtained in Florida Straits and off the West Coast of Florida July-December 1960, 111 pp. illus., processed. The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

GERMAN FEDERAL REPUBLIC:

Allgemeine Fischwirtschafts-Zeitung, Fachheft-Export, Special Technical Issue No. 34, August 26, 1961, printed in German and English. Verlag Carl Th. Gorg, Am Sorgfeld 110, Hamburg-Blankenese, German Federal Republic. A special issue dealing primarily with the export situation in Germany. Contains, among others, the following articles: "Export Prospects in the Wider Market," by Karl Kuhnke; "The Importance of Germany's Food Export Economy with Particular Regard to the Fish Economy," by von Albert M. Groening; "The Fish Economy Trade of the EEC Countries," by Margot Krohn; "The Situation in the Exportation Domain Concerning Fresh Fish, Quick Frozen Fish, and Fish By-products," "Last Product of German Fishery: The Frozen Fish," by E. G. Rudolphi; and "The Export of Salt Fish," by Erich Dehl.

GREECE:

Import Tariff System of Greece, WTIS Part 2, Operations Report No. 61-68, 2 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; import regula-

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tions; bases of specific and ad valorem duties; customs duties and surtaxes; sales and other internal taxes; and consular documents and fees.

HALIBUT:

Bering Sea Halibuts, by N. P. Novikov, Translation Series No. 329, 4 pp., processed. (Translated from the Russian, Rybnoe Khozjaistvo, vol. 36, no. 1, pp. 12-15, 1960). English translations available from the Fisheries Research Board of Canada Biological Station, Nanaimo, B. C., Canada.

HERRING:

"The Liquefaction of British Columbia Herring by Ensilage, Proteolytic Enzymes and Acid Hydrolysis," by J. R. McBride, D. R. Idler, and R. A. Macleod, article, Journal of the Fisheries Research Board of Canada, vol. 18, 1961, p. 39, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Preparation of Marinated Herring Using Lactic Acid," by H. Houwing, article, Conserva, vol. 8, 1960, pp. 252-253, printed in Dutch. Maanblad voor de Voedings- en Genotmiddelen-Industrie, Moormans Periodieke Pers N. V., The Hague, Netherlands.

"Un Rideau de Bulles d'Air Auxiliaire de la Pêche au Hareng," (Fishing for Herring with Aid of Air-Bubble Curtain), article, France Pêche, vol. 6, no. 54, September 1961, pp. 13-17, 19-22, illus., printed in French. France Pêche, Tour sud-est, Rue de Gue-mene, Boite Postale 179, Lorient, France.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) Statistical Yearbook, 1960, 67 pp., illus., printed. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B.C., Canada. A statistical summary covering the salmon fishery in Canada, Japan, and the United States; herring fishery in Canada and the United States; halibut fishery along the coast of the North American west coast; and the king crab fishery in the Eastern Bering Sea during 1960. Statistical tables cover landings of salmon, herring, halibut, and king crab; and salmon and king crab packs.

IRAN:

Licensing and Exchange Controls--Iran, WTIS Part 2, Operations Report No. 81-68, 11 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington 25, D. C., September 1961. Outlines Iran's import and exchange controls (general and special provisions, prohibited imports, and commercial profits tax); Iran's export controls and United States controls (exports, imports, and other controls). Includes list of prohibited import goods and list of goods subject to commercial profits tax (by tariff chapters).

ITALY:

"Fenomeni Alternativi del Pesce e Metodi Chimici per il Loro Riconoscimento" (Fish Spoilage and Chemical Methods for Recognizing It), by Antonio Montefredine and Concetta Testa, article, Bollettino di Pesca, Piscicoltura e Idrobiologia, vol. 15, Jan-

uary-June 1961, pp. 48-135, printed in Italian with summary in English. Bollettino di Pesca, Piscicoltura e Idrobiologia, Laboratorio Centrale di Idrobiologia, 91 Piazza Borghese, Rome, Italy.

JAPAN:

Progress Report of the Cooperative Investigations on Important Neritic-Pelagic Fisheries Resources 1956-1957, 320 pp., illus., printed in English and Japanese. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

KOREA:

Annual Report of the Central Fisheries Experiment Station, No. 1, 89 pp., illus., printed in Korean with summary in English. Central Fisheries Experiment Station, Pusan, Korea, 1960. Discusses the history and organization of the Central Fisheries Experiment Station, research and surveys of 1960, and contains a list of research vessels. A list of past publications is also included.

Bulletin of the Central Fisheries Experiment Station, No. 1--Processing and Food Technology, 138 pp., printed in Korean with summaries in English. Central Fisheries Experiment Station, Pusan, Korea, 1960. Contains, among others, the following articles: "Studies on the Chemical Change in Frozen Oyster and Shrimp during Cold Storage," by Bong Nai Lee and others; "Studies on the Improvement of the Salted Products. I--Influence of the Freshness of Raw Fish and the Quality of Salts Affecting in the Salted Fish; and II--Effectiveness of Chlorotetracycline and Salting Methods for Keeping Quality of the Salt Cured Products," by Sang Ho Shin and Jai Hyung Byun; and "Experiment to Increase the Yield of Agar-Agar," by Nam Ki Paek.

MARINE BACTERIA:

"Marine Bacteria and their Taxonomy," by John Liston and Rita R. Colwell, Contribution 116, article, Research in Fisheries 1960, pp. 18-20, printed. College of Fisheries, University of Washington, Seattle 5, Wash., March 1961.

MARINE PLANTS:

Marine Plant Resources of British Columbia, by Robert F. Seagel, Bulletin No. 127, 50 Canadian cents. The Queen's Printer and Controller of Stationery, Ottawa, Canada.

MARKING FISH:

"There's More Than One Way to Leave a Mark on Life," by Keen Buss, article Pennsylvania Angler, vol. 30, no. 10, October 1961, pp. 1-5, illus., printed. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Describes methods of marking fish which aids the biologist to determine movement, age and growth, population densities, and other habits of fish.

NAVIGATION:

United States Coast Pilot 3--Atlantic Coast, Sandy Hook to Cape Henry, Seventh Edition, 204 pp., printed, \$2.50. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., 1961. A nautical book containing a wide variety of information important to navigators. Subjects include landmarks, navigation regulations, channels, anchorages,

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dangers, weather, ice, routes, pilotage, and port facilities. Most of the information in the book cannot be shown conveniently on the standard nautical charts. The book is corrected through Notice to Mariners 24 of June 17, 1961.

NETHERLANDS:

Jaarcijfers over de Visserij Gedurende Het Jaar 1960 (Annual Fisheries Statistics, 1960), No. 52, 168 pp., illus., printed in Dutch with summaries in English, and statistical tables in both Dutch and English. Directie van de Visserijen, 's-Gravenhage, Netherlands, 1961.

NETS:

"The Development of German Driftnets for Salmon and the Test of New Types of Nets," by F. Thurow, article, Das Fischerblatt, vol. 7, 1959, pp. 197-201, printed in German. Das Fischerblatt, Landesfischerei-Verband Schleswig-Holstein, 108 Holstenstrasse, Kiel, Germany.

"Influence of Waves Against Behavior of the Double Drift Net in the Waters, the Case When the Net is put Parallel with Running Wave Direction," by Masatsune Nomura, Keishiro Mori, and Hajime Taketomi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, June 1960, pp. 570-576, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kai-gandori, Minato-Ku, Tokyo, Japan.

NEW ZEALAND:

Report on Fisheries for 1960, 23 pp., printed. R. E. Owen, Government Printer, Wellington, New Zealand. This report contains statistical data on fisheries for the calendar year 1960. Includes, among others, data containing estimated total quantities and values of the principal classes of fishery products marketed in 1960; and annual totals for the most important group of fish (wet fish) for years 1941-1950; the fishery for crayfish; fishing vessels and personnel; methods of capture; exports and imports; whaling; research and investigation; legislation on fisheries; etc.

NORWAY:

"Fiskefartoyers Lønnsomhet i 1959--Sesongresultater" (Fishing Vessel Profits in 1959--Annual Results), article, Fiskets Gang, vol. 47, no. 30, July 27, 1961, pp. 527-532, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

NUTRITION:

"The Assessment of Nutritive Value in Protein Concentrates by the Gross Protein Value Method," by J. Duckworth, A. A. Woodham, and I. McDonald, article, Journal of the Science of Food and Agriculture, vol. 12, 1961, p. 407, printed. Journal of the Science of Food and Agriculture, The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

"Fat Absorption during the First Year of Life in Prematurely Born Children after Administration of Different Amounts of Fish Oil," by V. Ya. Vashchilko, Fiziol Osobennosti Detsk Vozrasta i Voprosy Profilaktiki Zabalevani (Kharkov) Sbornik, 1959, pp.

93-100. Chemical Abstracts, vol. 55, No. 3747d, February 20, 1961.

Fish and Your Health, 2 pp., folder, illus., printed. U. S. Bureau of Commercial Fisheries, Southwest Area Marketing Office, 4232 Herschel Ave., Dallas 19, Texas. The tremendous interest all over the United States in polyunsaturated and saturated fats, cholesterol control, heart disease, etc., has prompted the issuance of a timely and useful leaflet, outlining the role of fish in diets for control of blood cholesterol levels, polyunsaturation, and use of oily and non-oily fish in the diet.

Forget Birthdays. . . Enjoy Good Eating, 2 p. folder, illus., printed single copy 3 cents (in quantities of 50--\$1.25; 100--\$2.00). The American Dietetic Association, 620 No. Michigan Ave., Chicago 11, Ill., September 1961. Contains facts regarding daily dietary requirements, the necessity for three well-planned meals a day, and the way to form good eating habits. The daily meal plans shown in the pamphlet all include fish.

"Nutritive Value of Maine Sardines. II--Animal Feeding Tests," by S. A. Miller and others, article, Journal of Nutrition, vol. 74, 1960, p. 70, printed. Journal of Nutrition, American Institute of Nutrition, 36th Street at Spruce, Philadelphia 4, Pa.

OCEANOGRAPHY:

Investigations of Inner Continental Shelf Waters Off Lower Chesapeake Bay. Part II. Sand Lance Larvae, AMMODYTES AMERICANUS, by John J. Norcross, and others, contribution No. 96, 9 pp., illus., printed. (Reprinted from Chesapeake Science, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

A Technical Report Bathymetric Reconnaissance of of Exhuma Sound, by Violet B. Seigler, 36 pp., illus., processed. The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

O.E.C.D.:

"Development Aid Accented as O.E.C.D. Comes Into Existence," article, Foreign Commerce Weekly, vol. 66, no. 18, October 30, 1961, pp. 5-6, printed, single copy 30 cents. U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the reconstitution of the Organization for European Economic Cooperation (O.E.E.C.) which was organized in April 1948 to administer Marshall Plan aid and to restore the European economy on a cooperative basis, to the newly-established Organization for Economic Cooperation and Development (O.E.C.D.). The new organization will take over two of the main aspects of O.E.E.C.'s work, the study of trade problems and of economic expansion, but on a scale which will include the North American countries. Will also aid in developing countries outside confines of Organization's membership, i.e. the newly-emerging nations of Africa and Asia.

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OYSTER DRILLS:

Sexual Behavior of the Oyster Drills: EUPLEURA CAUDATA and UROSALPINK CINEREA, by William J. Hargis, Jr., and Clyde L. Mackenzie, Jr., Contribution No. 100, 11 pp., illus., printed. (Reprinted from Nautilus vol. 75, no. 1, July 1961, pp. 7-16.) Virginia Fisheries Laboratory, College of William and Mary, Gloucester Point, Va.

OYSTERS:

Mass Culture of Phytoplankton as Foods for Metazoans, by Harry C. Davis and Ravenna Ukeles, article, 2 pp., illus., printed. (Reprinted from Science, vol. 134, no. 3478, August 1961, pp. 562-564.) American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

Prospectus on Oyster Rehabilitation for the Hillsborough County Port Authority, by K. D. Woodburn, 8 pp., processed. Director of Research, Florida State Board of Conservation, W. V. Knott Building, Tallahassee, Fla.

PACKAGING:

Vacuum Packaging as a Means for Prolonging the Storability of Smoked Herring Fillets, by M. von Schelhorn, 2 pp., printed. Jahresbericht über die Deutsche Fischwirtschaft, Berlin, Germany, 1957.

PLANKTON:

Investigations of Inner Continental Shelf Waters of Lower Chesapeake Bay. Part III. The Phorozooid Stage of the Tunicate DOLIOLUM NATIONALIS, by Robert M. Terry, contribution No. 99, 4 pp., illus., printed. (Reprinted from Chesapeake Science, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

The Oceanic and Bathypelagic Plankton of the North-East Atlantic, and its Possible Significance to Fisheries, by J. H. Fraser, Marine Research No. 4, 48 pp., illus., printed, 16s. Od. (US\$2.24). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1961.

PORTUGAL:

Gremio dos Armadores da Pesca de Arrasto, Relatório e Contas do Exercício de 1960 e Orçamento para 1961 (Trawler Owners' Guild, Statement of Operations for 1960 and Budget for 1961), 36 pp., illus., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal, March 15, 1961.

PROTEIN:

"The Quality of Fish Flour, Liver Meal, and Visceral Meal as Sources of Dietary Protein", by B. A. Larsen and W. W. Hawkins, article, Journal of the Fisheries Research Board of Canada, vol. 18, 1961, p. 85, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer & Controller of Stationery, Ottawa, Canada.

RHODESIA:

The Fishes of Northern Rhodesia, by P. B. N. Jackson, printed, 7s. 6d. (about US\$1.05). The Government Printer, P. O. Box 136, Lusaka, Northern Rhodesia. This book deals with every fish known from Northern Rhodesia except those of Lake Tanganyika. It is a checklist of that area, providing a key to identification of species, a description of each fish,

and a wealth of valuable information on their ecology and habits.

RED TIDE:

Red Tide Studies, Final Report 57-18, 24 pp., illus., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., July 1957.

SALMON:

"The Elusive Salmon", article, World Fishing, vol. 10, April 1961, pp. 73-74, printed. John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London, NW 1, England.

SCALLOPS:

Scallop Investigation, Tasman Bay 1959-60, by J. H. Choat, Fisheries Technical Report No. 2, 51 pp., processed. New Zealand Marine Department, Wellington, New Zealand.

SEAWEEDS:

Recovery of Swelling Agents from Seaweeds, by Tjoa S. Lian, German Patent No. 1,021,696, December 27, 1957. Deutsches Patentamt, Zeibucken, Strasse 12, Munich 2, Germany.

SHAD:

A Potomac River Shad Fishery, 1814-1824, by William H. Massmann, Contribution No. 98, 6 pp., illus., printed. (Reprinted from Chesapeake Science, vol. 2, no. 1-2, March-June 1961.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

SHRIMP:

Biological Observations on the Commercial Shrimp, PENAEUS DUORARUM Burkenroad, in Florida Waters, by Bonnie Eldred and others, Professional Papers Series No. 3, 139 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla. This report results from comprehensive studies that have been under way since 1955. Discusses methods and equipment used in the survey; Tampa Bay area monthly shrimp stations; Tortugas controlled area sampling; sex size disparity, ratio and sexual development of shrimp; and migration and sexual maturity. Also discusses the relation of temperature to distribution, spawning, and population densities; behavior, diet, growth, and parasites; incidental samples of *P. duorarum* from Florida waters; and commercial offshore shrimp catch (*P. duorarum*) from west coast of Florida.

Maturation and Spawning of the Pink Shrimp, PENAEUS DUORARUM Burkenroad, by William C. Cummings, Contribution No. 328, 7 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 90, no. 4, October 1961.) Transactions of the American Fisheries Society, Librarian, Colorado A. and M. College, Fort Collins, Colorado.

Notes on the Caridean Shrimp, RHYNCOCINETES RIGNES Gordon (CRUSTACEAE, DECAPODA), in the Western Atlantic, by Raymond B. Manning, Contribution No. 334, 7 pp., illus., printed. (Reprinted from Notulae Naturae, no. 348, November 10, 1961.) Notulae Naturae, The Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Turning Shrimp Waste into Profit," article, *Norwegian Fishing and Maritime News*, vol. 7, no. 1, 1960, p. 17, printed. *Norwegian Fishing and Maritime News*, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

SMALL BUSINESS MANAGEMENT:

Pointers on Meeting Competition, by Edward C. Bursk, Management Aids for Small Manufacturers No. 134, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1961. This report discusses pointers on meeting competition in business. Certain elements in today's economy such as automation, statistical decision-making, and the cost-price squeeze tend to force the large business into a pattern of standardization. Despite predictions to the contrary, these same conditions can bring new opportunities to small businessmen prepared to capitalize on them. He can retain his adaptability, and be in a good position to pick up opportunities that must be bypassed by his larger competitor.

Understanding Why They Buy, by Bertrand Klass, Small Marketers Aid No. 73, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1961. A report designed to tell small marketers what "motivation research" is and what it can mean to their businesses was issued recently by the Small Business Administration. Why customers buy as they do is an important question for small business owners and managers. Finding answers is often far from easy. But more and more businessmen are trying to find answers, and many are seeking scientific help in getting reliable ones. Some even feel that a really effective merchandising approach cannot be planned without knowing what makes customers buy—in other words, without "motivation research." The author recognizes that small marketers rarely engage in doing motivation research themselves, but suggests that they may be able to use the results of studies conducted by big concerns to merchandise their products. In this way, the small marketer can better organize and direct his selling efforts.

SMOKED FISH:

"The 3, 4-Benzopyrene Content of Fish Smoked by Different Processes," by N. D. Gorelova and others, article, *Voprosy Onkol.* vol. 6, No. 1, 1960, pp. 33-37, printed in Russian. *Chemical Abstracts*, vol. 55, No. 4814h, March 6, 1961.

SOUTH AFRICA REPUBLIC:

Import Tariff System of Republic of South Africa, WTIS Part 2, Operations Report No. 61-65, 4 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; import regulations; bases of specific and ad valorem duties; customs duties and surtaxes; sales and other internal taxes; and consular documents and fees.

Marine Studies off the Natal Coast, C.S.I.R. Symposium No. S2, 134 pp., illus., printed. The South African Council for Scientific and Industrial Research,

P. O. Box 395, Pretoria, South Africa, March 1961. A symposium on marine studies off the Natal Coast was arranged to review the present state of knowledge and to assess the more urgent needs for research. This report contains papers on "Origin and Development of the Natal Coast," "Meteorological Aspects, Especially Surface Winds and Associated Weather Along the Natal Coast," "The Near-shore Circulation of Water," "Bathymetric and Hydrographic Aspects of Marine Studies off the Natal Coast," "The Use of Drift-Cards to Deduce Currents Along the Natal Coast," "The Nearshore Movement of Sand at Durban," "Some Aspects of Offshore Whaling," "Intertidal and Estuarine Fauna," "A Quantitative Assessment of the Effects of Factory Effluent Upon Littoral and Estuarine Faunas at Umkomaas," "Shark Research in Natal," "Fisheries Research in Natal Waters," and "Basic Model Studies of Nearshore Wave Action."

SPAIN:

"La Gamba del Golfo de Cadiz y Marruecos" (The Shrimp of the Gulf of Cadiz and Morocco), article, *Puntal—Revista Maritima y Pesquera*, vol. 8, no. 89, pp. 16-21, illus., printed in Spanish. *Puntal—Revista Maritima y Pesquera*, Ramon y Cajal 3, Apartado 316, Alicante, Spain.

La Pesca Espanola en 1960 (The Spanish Fisheries in 1960), article, *Boletin de Informacion del Sindicato Nacional de la Pesca*, nos. 34-35, July-August 1961, pp. 13-19, printed in Spanish. *Sindicato Nacional de la Pesca*, Paseo del Prado, 18-20, Madrid, Spain.

SPONGES:

"Antimicrobial Substances from Sponges," by Sophie Jakowska and Ross F. Nigrelli, article, *Annals of the New York Academy of Science*, vol. 90, Art. 3, 1960, pp. 913-916, printed. New York Academy of Science, 2 E. 63rd St., New York 21, N.Y.

"Contributions to the Study of Marine Products. L-Phospholipids of Sponges," by Robert A. Landowne and Werner Bergmann, article, *Journal of Organic Chemistry*, vol. 26, April 1961, pp. 1257-1261, printed. *Journal of Organic Chemistry*, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Nucleic Acids of Sponges," by Martin F. Stempien, Jr., article, *Annals of the New York Academy of Science*, vol. 90, Art. 3, 1960, pp. 910-912, printed. New York Academy of Science, 2 E. 63rd St., New York 21, N.Y.

STARFISH:

"Confirmation of Saponin as a Toxic Principle of Starfish," by Yoshiro Hashimoto and Takeshi Yasumoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, November 1960, pp. 1132-1138, printed in Japanese and English. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

STORAGE:

"French Tests on the Pre-Storage of Sardine on Board Fishing Boats by Cooling in Sea Water at -0°C," article, *Rev. Conserve*, vol. 15, May-June 1960, pp. 130-131, printed in French. *Rev. Conserve*, Societe d'I-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Edition pour l'Alimentation, 1 Rue de la Real, Paris, France.

STORAGE LIFE:

"Studies on the Evaluation of Freshness and on the Estimation of the Storage Life of Raw Fishery Products," by Lionel Farber and Peter Lerke, article, Food Technology, vol. 15, April 1961, pp. 191-196, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

STRIPED BASS:

Movements of Striped Bass Tagged in Virginia Waters of Chesapeake Bay, by William H. Massmann and Anthony L. Pacheco, Contribution No. 97, 7 pp., illus., printed. (Reprint from Chesapeake Science, vol. 2, no. 1-2, March-June 1961, pp. 37-44.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

TIDEWATER FISHERIES:

Department of Tidewater Fisheries: What It Is, What It Does, 36 pp., printed. Tidewater Fisheries Commission, State Office Bldg., Annapolis, Md. A report of the Department of Tidewater Fisheries with statements about its organization and activities from the reorganization July 1, 1959, to December 1, 1960. Discusses, among others, the oyster propagation program, soft-shell clams, and finfish and crab program.

TRADE LISTS:

The Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Food--Producers and exporters--Egyptian Region of United Arab Republic, 3 pp. (October 1961). Lists names and addresses, size of firms, and types of products handled by each firm. Includes fish canneries, and producers and exporters of frozen shrimp and sardines.

TRASH FISH:

Preservation of Trash Fish, by William Saenz and D. L. Dubrow, Marine Fisheries Research Report, Special Service Bulletin No. 17, 5 pp., processed, Marine Laboratory, Institute of Marine Science of the University of Miami, Virginia Key, Miami 49, Fla. (Available from Florida State Board of Conservation, Tallahassee, Fla.) A simple and inexpensive method for the preservation of "trash fish" on board vessels is described. This method involves converting the trash into liquid fish and stabilizing it in an acid medium. The resulting slurry can be converted into fertilizers, animal foods, purified chemical foods, and fish meal.

TRAWLERS:

"A German Stern Trawler with Novel Winching Arrangements," article, World Fishing, vol. 10, May 1961, p. 62, printed. John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London, NW1, England.

TROUT:

Movements and Growth of Spotted Seatrout, CYNO-SCION NEBULOSUS (Cuvier), in West Florida, by Alan W. Moffett, Technical Series No. 36, 35 pp., illus., printed. The Marine Laboratory, Institute of Marine Science of the University of Miami, Virginia Key, Miami 49, Fla., May 1961. (Available from Florida State Board of Conservation, Tallahassee, Fla.) This report covers a description of the spotted sea trout fishery, materials and methods, tag-releases, movements, growth, and spawning. The small amount of movement observed between tagging areas suggests that a series of nearly isolated groups of spotted sea trout exist on the west coast of Florida. Connection is maintained between these groups because of a few fish which make longer movements. However, for the purposes of fishery management the areas may be considered separate, and regulations made affecting one area would have little effect in other areas. The decline of commercial landings of spotted sea trout in Florida, which began in 1952, reached a low in 1955 but since have increased. This suggests that the cause may have been cyclical. At present, there is no information to indicate that spotted sea trout on the west coast of Florida are being overexploited.

TUNA:

"Observations on 'Green' Tuna," by A. M. Dollar and others, article, Food Technology, vol. 15, no. 5, 1961, pp. 253-255, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

"Tagging and Recovery of Tropical Tunas, 1955-1959," by Milner B. Schaefer, and others, Inter-American Tropical Tuna Commission Bulletin, vol. 5, no. 5, 111 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

TURKEY:

"Balık Endüstrimizi Geliştirmek için Fon" (ICA Fund to Develop Our Fishing Industry), by Suleyman Arisoy, article, Türkiye İktisat Gazetesi, no. 430, June 22, 1961, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Balıkçılık Kooperatiflerimizin Reorganizasyonu" (The Reorganization of Our Fishing Cooperatives), by Suleyman Arisoy, article, Türkiye İktisat Gazetesi, no. 416, March 9, 1961, p. 4, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Dunyada Açıklıkla Mücadele Kampanyası ve Türkiye Balıkçılığı" (Turkey's Fisheries and Freedom from Hunger Campaign "FFHC") by Suleyman Arisoy, article, Türkiye İktisat Gazetesi, no. 424, May 4, 1961, p. 4, printed in Turkish. Odalar Birliği Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Prof. Baade Raporuna Göre Balıkçılığımız ve Beslenme İmkânlarımız" (Our Nutrition Possibilities and Our Fisheries in the Light of Prof. Baade's Report), by Suleyman Arisoy, article, Türkiye İktisat Gazetesi, no. 403, December 8, 1960, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Prof. F. Baade'ye Gore 1975 Yilinda Turkiyenin Gıda Problemive Balıkçılıgımız" (Nutrition Problems and Turkish Fisheries in 1975 according to Prof. Baade's Report), by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 437, August 10, 1961, p. 5, printed in Turkish. Okalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Türk Standartları Enstitüsü (TSE) Kanununun Kabulü Dolayısıyla Dünyada ve Türkiye'de Balık Endüstrisi Mamullerinin Standardizasyonu" (The Standardization of Fish Processing in Turkey and the World in the Light of the Act of Turkish Standardization Institute "TSE"), by Suleyman Arisoy, article, *Türkiye İktisat Gazetesi*, no. 404, December 15, 1960, p. 5, no. 405, December 22, 1960, p. 5, printed in Turkish. Odalar Birliği Matbaası, P. K. 397, Ankara, Turkey.

"Türkiye Balık Ekonomisinin Gelişmesinde T. C. Ziraat Bankası Mufettislerinin Vazife ve Mes'uliyeti" (Duties and Responsibilities of Inspectors of the Agricultural Bank of the Turkish Republic in the Development of the Turkish Fisheries Economics), by Suleyman Arisoy, article, *Türkiye Cumhuriyeti Ziraat Bankası Teftis Bülteni*, vol. 3, nos. 31, 32, 33, July-September 1960, pp. 20-25, printed in Turkish. T. C. Ziraat Bankası Matbaası, Ankara, Turkey.

--Listings under Turkey supplied by Suleyman Arisoy, Fisheries Advisor, Agricultural Bank of the Turkish Republic, Ankara, Turkey.

U.S.S.R.:

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE FISHERIES RESEARCH BOARD OF CANADA BIOLOGICAL STATION, NANAIMO, B. C.

Commercial Fishes of the Anadyr River and the Anadyr Estuary, by A. G. Kaganovskii, Translation Series no. 282, 5 pp., processed. (Translated from the Russian, *Vestnik Dalnevostochnovo Filiala Akademii Nauk SSR* for 1933, No. 1-3, pp., 137-139, 1933, Vladivostok).

VIET NAM:

Licensing and Exchange Controls--Viet-Nam, WTIS Part 2, Operations Report No. 61-69, 6 pp., printed, single copy 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington 25, D. C., September 1961. This report discusses the import and export controls of Viet Nam, and United States import and export controls.

WASHINGTON:

1960 Fisheries Statistical Report, by Robert Robison, Dale Ward, and Arthur Palmen, 94 pp., illus., printed. Washington State Department of Fisheries, 4015 20th Ave., W., Seattle 99, Wash., 1961. Contains statistical data on salmon landings in the Puget Sound, Grays Harbor, Willapa Harbor, and Columbia River Districts; bottomfish landings; oyster production; and shellfish landings in the Puget Sound and Grays Harbor Districts. Also covers the Indian fisheries; fishway counts at the various dams in the State of Washington; and related subjects.

WHALE OIL:

"The Absorption Spectrum of the Molecular Distillation Residue of Whale-Liver Oil," by Yoshimori Omote, article, *Nippon Kagaku Zasshi*, vol. 80, 1959, pp. 804-805. Chemical Abstracts, vol. 55, No. 3093i, February 6, 1961.

WHALES:

"Studies on Whale Lipase. I--Lipase of the Pancreas of Little Finner," by Yoshio Ishihara, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, May 1960, pp. 23-28, printed in Japanese. Bulletin of the Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

CHANGE OF ADDRESS

In the November 1961 issue, page 88, article "Commercial Application of Accelerated Freeze-Drying," the address of the National Business Publications, Ltd. (publisher of the Canadian Refrigeration and Air-Conditioning Journal) has been changed to Gardenvale, Quebec, Canada.



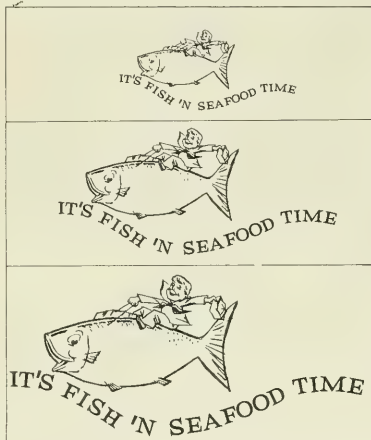
HEAT PENETRATION IN CANNING FISHERY PRODUCTS DEPENDS ON SIZE OF PARTICLES

The size of the particles into which a canned product is divided has considerable effect on the rate of heat penetration. For example, shrimp will heat through to the center more rapidly than salmon because a can of shrimp contains a large number of small pieces and salmon one or two large pieces.

--Principles and Methods in the Canning of Fishery Products, Research Report No. 7 (page 21), U. S. Fish and Wildlife Service.

"IT'S FISH 'N SEAFOOD TIME," MARCH 7-APRIL 22

The commercial fishing industry's Lenten promotion this year will take place March 7-April 22. Food stores are urged to use the emblem shown as a masthead in their newspaper ads. Restaurants are asked to feature the emblem on their menus.



News releases together with pictures of fish dishes will appear in newspapers and magazines throughout the Lenten period. Radio and television programs are also planned. Processors and packers of fishery products as well as other segments of the fishing industry will be doing extensive advertising in all media.

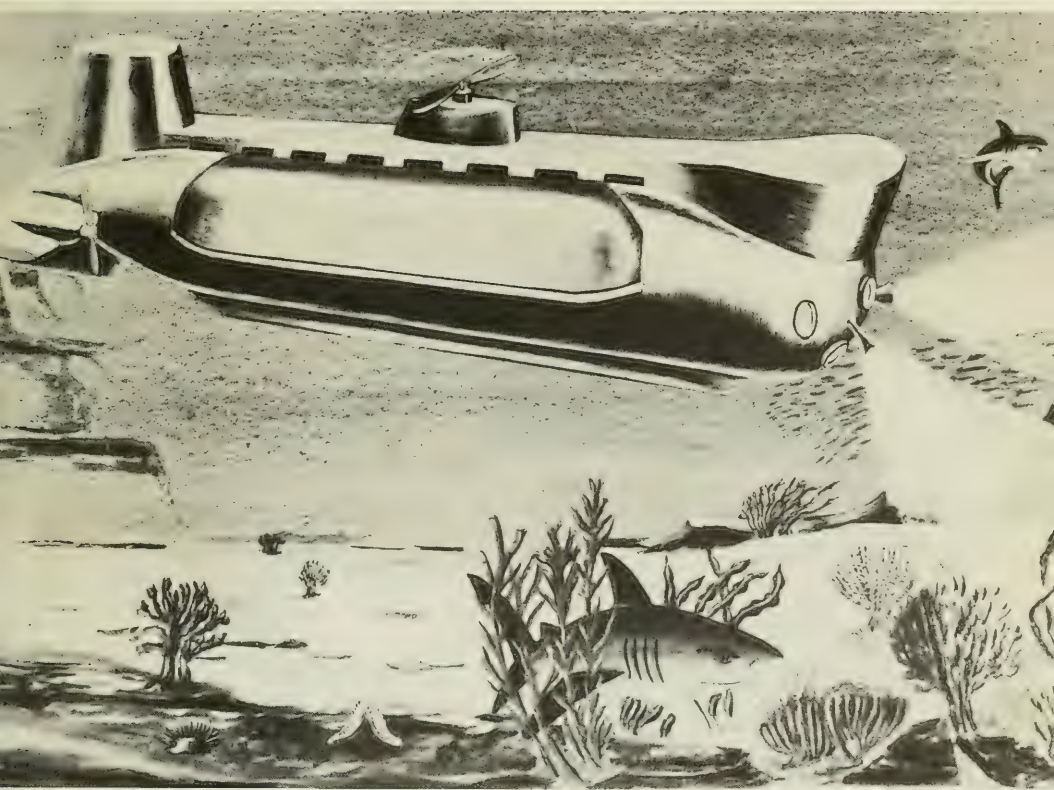
The National Fisheries Institute states that restaurant and eating-out magazines will be furnished articles and photographs of suggested fish 'n seafood dishes for their food pages. In addition, there will be advertisements for the Halibut Association of North America, the National Shrimp Breaders Association, and the Shrimp Association of the Americas in the same magazines. Individual fishery firms also will be running ads.

The U. S. Bureau of Commercial Fisheries is cooperating with the commercial fishing industry in its industry-wide Lenten Promotion. The Bureau has developed and distributed a variety of educational and information materials for use during the Lenten promotion. In addition, Bureau marketing specialists and home economists will be appearing on radio and television. Bureau materials will stress menu variety, ease of preparation, nutritional value, and other health benefits in using fish and shellfish in the diet.

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Fishes

ROBERT H. EBB

COMMERCIAL FISHERIES REVIEW



DL. 24, NO. 3

MARCH 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

Publication of material from sources outside the Bureau is not an endorsement. The Bureau is not responsible for the accuracy of facts, views, or opinions contained in material from outside sources.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

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SOME USES FOR WHALE SPERM OIL

Researchers for a large oil refining firm have developed new uses for sperm whale oil. They found, among other things, that sperm oil is a good lubricant for engines because the viscosity changes very little at wide ranges in temperature. This also makes it valuable as a liquid in new fluid-drive transmissions. It does not dry like linseed or turn rancid like cottonseed oil. It can be processed in a number of different ways for different uses. It has high film strength and can loosen a rusted nut on a bolt in seconds. Jewelers pay about \$5 an ounce for the sperm oil they use to lubricate watches.

Sperm oil, which is more of a liquid wax than an oil, has become essential to a number of industries. It is used to impart a rich, glossy sheen to cosmetics such as facial creams. It gives softness and flexibility to leathers. In textiles, sperm oil lubricates the fibers to prevent unraveling as they are twisted into threads. It is used in detergents, wetting agents, fiber softeners, hand soaps, rust-proofing compounds, and scores of other products linked with the ever-growing chemical industry. (Maine Coast Fisherman, Vol. 11, No. 4, November 1956.)

Editorial Assistant--Ruth V. Keefe

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BLUE CRAB TRAWL FISHERY OF GEORGIA

By Robert Cummins, Jr.*, and Joaquim B. Rivers*

SUMMARY

A year-round trawl fishery for blue crabs is conducted in the coastal waters of the South Atlantic States. Off Georgia, the sheltered bays and sounds close to the home ports of the trawlers are the trawling grounds. Consequently, weather seldom interferes with fishing and trips can be kept short. From June through December the trawlers drag small-mesh nets for both shrimp and crabs; from January through May, when shrimp are scarce, large-mesh nets are dragged solely for crabs. A good double-rigged trawler can average approximately 1,500 to 2,000 pounds of crabs a day. Most of the trawl-caught blue crabs from the grounds off Georgia are processed in Brunswick.

BACKGROUND

Blue crabs (*Callinectes sapidus*) are the basis for one of the most stable commercial fisheries of the South Atlantic States. In 1959, over 32 million pounds of crabs, worth roughly \$1.7 million ex-vessel, were landed in ports in North and South Carolina and Georgia (Power 1961).

Conventional blue crab gear and fishing methods have been described by Andrews (1947), Cargo (1954), and Wharton (1954) from observations made in the Chesapeake Bay States. Gear described by one or more of those authors includes pots, trotlines, scrapes, dredges, fyke nets, haul seines, push nets, and dip nets.

Blue crab fishing in the South Atlantic States, however, is unique in that specially designed crab trawls are used in addition to pots and trotlines. The trawl fishery for blue crabs has never been adequately described.

This article is based on observations of the blue-crab trawl fishery as it is carried out in coastal waters of Georgia. In general features at least, the descriptions of trawling methods and gear are applicable also to crab trawling in North and South Carolina.

THE FISHERY

The fishery operates year-round. From June through December, both shrimp and crabs are fished, and small mesh nets are used. From January through May, owing to a usual gen-

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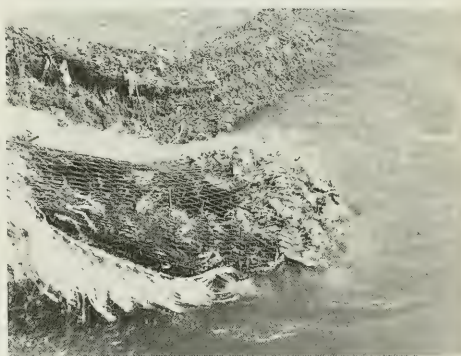


Fig. 1 - Hauling aboard a crab trawl laden with "grass."

eral scarcity of shrimp, only crabs are fished, and there is a general switch to larger mesh nets.

GROUNDING: Crab trawling is conducted, primarily, in sheltered bays and sounds along the coast of Georgia where, except for occasional fog, fishing is seldom stopped by bad weather. Fishing depths seldom exceed 50 feet. Few obstructions interrupt the mixture of sand, mud, and clay that uniformly characterizes the coastal grounds, and home ports for the trawlers are rarely far distant. Principal drawbacks to crab trawling in the area are: (1) large amounts of "grass" (fig. 1) and jellyfish that, when caught, clog the trawls and occasionally cause some gear damage; and (2) the presence in early summer of loggerhead turtles and large numbers of stingrays that make handling the catch more difficult and that also occasionally cause gear damage.

FISHING OPERATION: Fishing is done from conventional shrimp vessels of the types described by Sundstrom (1957) and Knake, Murdock, and Cating (1958). The procedure followed varies only slightly from shrimp fishing. The boats arrive on the grounds near daylight, and the trawls are set, usually with a warp-scope ratio of 5:1 (5 feet of trawl warp for every 1 foot of water depth). Average dragging time is 2 hours, after which the gear is retrieved. The bag is tripped (fig. 2), and most of the catch falls on deck (fig. 3). Crabs cling-



Fig. 2 - "The moment of truth"--tripping the bag.



Fig. 3 - Catch of a Georgia crab trawl on deck.

ing to the webbing (fig. 4) are knocked loose with a stick ("crab knocker"), and the emptied trawl is reset immediately. Only after resetting does sorting of the catch begin. When only crabs are fished, 3 to 4 drags are considered a day's work, and the vessel usually returns to port late in the afternoon. When shrimp as well as crabs are fished, the working day is usually longer, and trips may last 2 to 3 days.

CRAB CATCHES AND CRAB PRODUCTION: Catches vary widely. As many as 2,800 pounds of crabs have been reported from a single 1-hour drag. But the average catch, from the usual 2-hour drag with a single 55- to 60-foot trawl appears to be close to 250 pounds. Double-rigged vessels would, therefore, average roughly 500 pounds in a 2-hour drag, or 1,500 to 2,000 pounds daily (fig. 5).

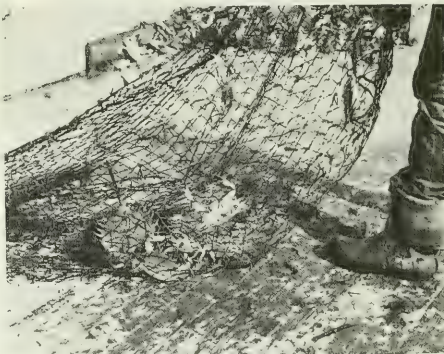


Fig. 4 - Blue crabs and a horseshoe crab tangled in the trawl webbing.

Wharton (1954) states that the average daily catch from 50 chicken-wire crab pots in the Chesapeake Bay is between 200 and 500 pounds. A double-rigged vessel making 4 drags a day could be expected to average as many crabs as could be caught on the average with 150 to 500 pots (assuming that differences in availability of crabs between the Chesapeake and the coast of Georgia can be disregarded).

A good crab trawler, operated by a crew of two men, can expect to stock \$110 in crabs in two days. Half of this goes to the vessel. Additional stock is obtained from seasonal shrimp catches and from the small amounts of food fish that are taken incidentally.

Table 1 - Blue Crab Landings in Georgia ^{1/}			
Year	Total Landings, all Gear	Trawl Landings	Portion of Landings Caught by Trawling
	(Pounds)		Percent
1960	15,766,000	2,576,700	16
1959	12,682,500	4,192,600	33
1958	10,185,000	3,658,300	26
1957	8,968,000	2,067,000	24
1956	8,542,000	2,140,800	25
1955	10,745,000	2,012,500	19
1954	10,640,000	2,259,400	21
1953	9,486,000	1,985,000	21
1952	9,458,200	4,410,400	47
1951	6,526,400	1,535,000	24
1950	5,027,600	1,045,000	21

^{1/}From Fishery Statistics of the United States, U. S. Fish and Wildlife Service, 1950-59.

The percentage of total crab landings due to trawling varies from year to year (table 1) as does the number of vessels engaged in the crab trawl fishery. Availability of other, more profitable, fishery resources is apparently a major determining factor.

PORTS: Most of the crabs caught along the coast of Georgia are processed in Brunswick in the largest processing plant in that State. Some crabs are landed directly in Brunswick; others are landed in the northern part of the State, especially in Thunderbolt, and are either trucked to Brunswick or processed locally.

FISHING GEAR

Gear used in the trawl fishery for blue crabs is nearly identical with that used in the shrimp fishery. The principal difference lies in the larger mesh (4-inch stretched mesh) used in crab trawls only when crabs are fished. Large mesh nets are favored, for they can be repaired more easily and cheaply than small mesh nets, and they allow small fish and shrimp to escape more readily. Also, many fishermen believe that large mesh nets spread better and fish a larger area than do small mesh nets. When both shrimp and crabs are fished, nets similar in size to shrimp trawls are used.

Gear combinations vary widely in the crab fishery, just as Juhl (1961) has shown they do in the shrimp fishery. Combinations used in the crab fishery range from 50-foot nets and 6½-foot doors pulled by 35-foot single-rigged vessels, to 96-foot nets and 9-foot doors pulled by 55- to 60-foot single-rigged vessels, and twin 45- to 50-foot nets and 7½-foot doors pulled by 55- to 60-foot double-rigged vessels. The most popular nets used in the crab fishery are similar to the 4-seam shrimp trawls described by Bullis (1951).

CONSTRUCTING A 57-FOOT CRAB TRAWL: Materials needed for a 57-foot 4-seam crab trawl are listed, with their approximate (1961) prices, in table 2. The starting point for trawl construction is a rectangular piece of webbing, 373 meshes long by 100 meshes deep



Fig. 5 - A good day's catch (2,500 pounds of blue crabs) being unloaded at a Georgia plant.

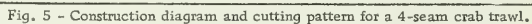


Table 2 - Materials Needed for Construction of a 57-Foot 4-Seam Crab Trawl

Trawl Part	Description	Quantity	Unit Price (1961)	Total Price (1961)
Webbing:				
Net	Panel, 373 by 100 meshes, 21-thread cotton, 4-inch mesh	44 lbs.	\$ 1.60/lb.	\$ 70.40
Cod end	Panel, 75 by 100 meshes, 42-thread cotton, 4-inch mesh	15 lbs.	1.90/lb.	28.50
Chafes	Panel, 40 by 100 meshes, 42-thread cotton, 4-inch mesh	9 lbs.	1.90/lb.	17.10
Floatline^{1/}:				
Wire rope	3/8-inch diameter combination rope	72 ft.	.12/ft.	8.74
Thimbles	3/8-inch, galvanized	2 ea.	.14 ea.	.28
Floats	Sponge (synthetic)	7 ea.	.49 ea.	3.43
Brail lines	6-thread fine or cotton equivalent	12 ft.	.02/ft.	.24
Leadline^{1/}:				
Wire rope	3/8-inch diameter combination rope	76 ft.	.12/ft.	9.12
Thimbles	3/8-inch diameter, galvanized	2 ea.	.14 ea.	.28
Chain	1/4-inch diameter, galvanized, proof coil	53 lbs.	.40/lb.	21.20
Accessories:				
Tickler chain . .	1/4-inch diameter, galvanized, proof coil	45 lbs.	.40/lb.	18.00
Shackles	5/16-inch diameter (for tickler chain)	2 ea.	.65 ea.	1.30
Swivels	5/16-inch diameter (for tickler chain)	2 ea.	1.35 ea.	2.70
Bag rings	2-inch, galvanized	15 ea.	.15 ea.	2.25
Twine	36-thread cotton, for hanging	3 lbs.	1.30/lb.	3.90
Rope yarns	Polyethylene (for chafing gear and tying loop chain)	15 lbs.	.55/lb.	8.25
Preservative . . .	Tar or green-treat (copper naphthenate)	74 lbs.	.20/lb.	14.80
Total				210.49

^{1/}Including 6-foot leglines and splices.

and preferably with a double selvage. The webbing should be laid out and cut as shown in figure 6. Net sections should then be sewn together according to the instructions provided by Bullis (1951). Special attention should be paid to Bullis' discussion of the difference between body seam cuts and corner seam cuts and to his description of techniques for sewing tapered seams.^{1/}

EXTENSION PIECE: Depth of the extension piece used with the 4-seam trawl varies with the individual preferences of the netmaker concerned. Some netmakers prefer to use minimum webbing in the trawl. This they do by matching the top and bottom bellies and cutting off the overlap that results from the drop-back. Others add sufficient meshes to the top belly to compensate for the drop-back. Still others compensate for the drop-back and then add an additional 20 to 50 meshes to both top and bottom bellies to extend them further. There is, at present, no way of properly evaluating these modifications.

TRAWL ACCESSORIES: Two important accessories are added to the basic net; the first increases the effectiveness of the trawl, and the second prolongs its life. These accessories are the tickler chain and chafing gear.

Tickler Chain: The tickler chain sets up a disturbance in front of and parallel to the leadline and also acts as a snagline (Scolfield 1948). Both actions are believed to improve the catch. The tickler generally consists of a piece of $\frac{1}{4}$ -inch-diameter chain fastened between the doors from points of attachment at their bottom trailing edges.

^{1/}A few net makers prefer nets with rolled seams similar to those described by Knake (1956) for fish trawls. They feel that such seams are stronger and lessen the chance of the cod end becoming separated from the body under strain.



Fig. 7 - Cod end of a Georgia crab trawl showing the 4-inch stretched mesh webbing and polyethylene chafing gear.

Determination of chain length is related to the size of the trawl mouth, measured from door to door along the floatline or leadline, and to the personal preferences of the user. Three common methods of determining tickler-chain length are: (1) the chain is made equal to the length of the floatline; (2) it is cut 4 to 5 feet shorter than the leadline; or (3) it is made equal to one-half the combined length of the floatline and leadline. In all three methods, lengths of the trawl leglines are included in the measurements.

Chafing Gear (fig. 7): Long-lasting polyethylene rope yarns have largely replaced manila rope yarns and strips of automobile inner tubes as chafing gear. The polyethylene yarns are almost 35 percent lighter than manila, are non-absorbent, and are approximately 7 times as resistant to abrasion. Polyethylene gear has one serious disadvantage. Being buoyant, the yarns tend to float up from under the trawl, thereby reducing the amount of protection afforded. Constant attention is necessary to see that the yarns remain properly and firmly secured to the cod end.

LITERATURE CITED

- ANDREWS, EMMETT
1947. Crab Pot Construction (Chesapeake Bay Type). U. S. Fish and Wildlife Service, Fishery Leaflet 262 (September), 4 pp.
- BULLIS, HARVEY R., Jr.
1951. Gulf of Mexico Shrimp Trawl Designs. U. S. Fish and Wildlife Service, Fishery Leaflet 394 (September), 16 pp.
- CARGO, D. G.
1954. Maryland Commercial Fishing Gears. Part 3. The Crab Gears. Educational Series No. 36, Board of Natural Resources, State of Maryland, Department of Research and Education (April), 18 pp.
- JUHL, ROLF
1961. A Study of Vessel and Gear Usage in the Shrimp Fishery of the Southeastern United States. Commercial Fisheries Review, vol. 23, no. 8 (August), pp. 1-8. (Also Separate No. 624.)
- KNAKE, BORIS O.
1956. Assembly Methods for Otter Trawl Nets. U. S. Fish and Wildlife Service, Fishery Leaflet 437 (December), 29 pp.
- KNAKE, BORIS O.; MURDOCK, JAMES F.; and CATING, JAMES P.
1958. Double-Rig Shrimp Trawling in the Gulf of Mexico. U. S. Fish and Wildlife Service, Fishery Leaflet 470 (September), 11 pp.
- POWER, E. A.
1961. Fishery Statistics of the United States, 1959. U. S. Fish and Wildlife Service, Statistical Digest 51, 457 pp.
- SUNDSTROM, GUSTAF T.
1957. Commercial Fishing Vessels and Gear. U. S. Fish and Wildlife Service, Circular 48, 48 pp.
- SCOLFIELD, W. L.
1948. Trawling Gear in California. State of California, Division of Fish and Game, Fishery Bulletin No. 72, 63 pp.
- WHARTON, JAMES
1954. The Chesapeake Bay Crab Industry. U. S. Fish and Wildlife Service, Fishery Leaflet 358 (Revised), (September), 17 pp.



CURED FISH FIRST MANUFACTURE ON NORTH AMERICAN PACIFIC COAST

"Cured fish of various types were the first manufactured products prepared on the Pacific coast. The Indians had a considerable dried-salmon industry at The Dalles, on the Columbia River, long before the coming of the white man. The fish were traded to the plains tribes of the interior. . . . The Russians operated a commercial salt-salmon industry in Alaska at the beginning of the 19th century. Salt salmon was shipped as far as St. Petersburg. Soon afterward the Northwest Fur Company started a salmon-salting business on the Columbia River. The Northwest Company merged with the Hudson's Bay Company which shipped salt salmon to Hawaii, Australia, China, Japan, and the eastern United States. American fishermen salted salmon in Alaska while it was still a Russian possession. A number of the large salmon canneries of today were originally established as salmon salteries."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 18 (page 5),
U. S. Fish and Wildlife Service.

COMPARISON OF pH, TRIMETHYLAMINE CONTENT, AND PICRIC ACID TURBIDITY AS INDICES OF ICED SHRIMP QUALITY

By Sammie Bethea* and Mary E. Ambrose**

ABSTRACT

As possible indices of quality during iced storage, a study was made of the changes in pH and trimethylamine nitrogen content of raw headless brown shrimp. Results were compared with those obtained from picric acid turbidity tests conducted simultaneously on the same shrimp and previously reported. The quality ratings of the shrimp as determined by a taste panel were used as standards for all tests. Changes in color and viscosity of shrimp homogenates were also observed for possible use as accessory tests of quality.

The data show that definite pH values could be assigned for different quality evaluations of brown shrimp from a certain production area, and thus could furnish an objective quality index. Trimethylamine nitrogen values were of use in assessing quality, but only after prime quality had disappeared and off-flavors had become apparent to the taste panel. The picric acid turbidity test gave indications of loss of quality several days before the taste panel could detect any off-flavors. A change in the color of the homogenates from pink to brown and an increase in viscosity accompanied the decrease in quality.

INTRODUCTION

Many objective tests for shrimp quality have been investigated, but none has been in itself completely satisfactory for evaluating the deterioration of quality from prime condition to spoiled. Bailey, Fieger, and Novak (1956) outlined three groups of tests on ice-stored shrimp that indicate (1) changes in prime quality, (2) the onset of spoilage, and (3) changes in relative quality. Of the tests included in the third group, change in pH is the simplest to apply and indicates loss of prime quality and spoilage at definite pH readings. Determinations of trimethylamine nitrogen content is one of the tests used to indicate the onset of spoilage, although it gives no information of prespoilage changes (Fieger and Friloux 1954).

A new test for evaluating shrimp quality, known as the picric acid turbidity test, has been developed and tested at this Laboratory by Kurtzman and Snyder (1960). This test indicates, by increasing turbidity, loss of good quality of iced shrimp as measured by a taste panel, although the mechanisms involved are not thoroughly understood. The objectives of the work reported in this paper were therefore as follows: (1) to conduct the conventional tests of pH and trimethylamine nitrogen determinations in conjunction with the picric acid turbidity test to determine whether either the pH or the trimethylamine nitrogen content of the shrimp was possibly a contributing factor to the formation of turbidity, (2) to determine whether these determinations would be applicable to shrimp held in ice but peeled and de-veined before testing, and (3) to determine whether changes in color and viscosity of the shrimp homogenates could possibly be used as accessory tests for quality.

EXPERIMENTAL

SAMPLE: One lot of headless brown shrimp (*Penaeus aztecus*) that was part of the last net load caught during a normal commercial operation just prior to docking of a fishing vessel at Brownsville, Tex., was used in this study. The shrimp were frozen immediately after being landed and were sent to the laboratory at College Park, Md.

Part of the lot was held at -5° F. to be used for frozen controls. The remainder was thawed at 35° F., then layered in crushed ice and held in a 35° F. cold room. These shrimp were re-iced in fresh ice every other day.

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SEP. NO. 643

SENSORY TEST: The quality of both the frozen shrimp and the iced shrimp was determined by a taste panel composed of five members. The panel graded the shrimp as high, good, fair, borderline, or inedible (Kurtzman and Snyder, 1960). Numerical values from 5 to 1 were assigned to these categories in the order of decreasing quality (figs. 1 to 3).

PHYSICAL AND CHEMICAL TESTS: Two 50-gram samples were taken daily from the frozen lot of shrimp and thawed, and two were taken from the iced lot. The four samples of shrimp were each peeled, deveined, and homogenized for 1 minute in a mechanical blender with 100 milliliters of demineralized water. Beginning on the 14th day of the experiment, 200 milliliters of water were used for each sample, and on the last two days 400 milliliters were used. These concentration changes were necessary in order to permit pipetting an aliquot of sample because of increased formation of gelatinous material.

The pH of the shrimp homogenates was then determined at room temperature.

The trimethylamine nitrogen content of the shrimp was determined by the method of Dyer (1945) as modified by Hoogland (1956).

The picric acid turbidity test was conducted on samples varying in size from individual shrimp to 100 grams ¹/₁. The test consists of measuring by means of a Klett-Summerson photoelectric spectrophotometer the turbidity of filtrates obtained from slurries of shrimp macerated in 70-percent alcohol with saturated aqueous picric acid added. An increase in turbidity is indicative of loss of quality of the shrimp.

The color and viscosity of the homogenates were observed visually.

RESULTS AND DISCUSSION

ICED SHRIMP: Sensory Test Results: The taste panel considered the freshly-thawed shrimp to be high quality. On the 5th day, the panel still rated the shrimp as good quality. On the 8th and 10th days, the panel rated the shrimp as fair quality, on the 12th day, as borderline quality, and on the 15th day as inedible (figs. 1 to 3).

pH Readings: The pH of homogenates of the fresh shrimp was 7.24, and it increased to 7.80 on the 5th day. By the 8th day, the pH had risen to 8.20, and readings remained between 8.00 and 8.20 during the periods of fair and borderline quality. When spoilage occurred, the pH exceeded 8.20 (fig. 1).

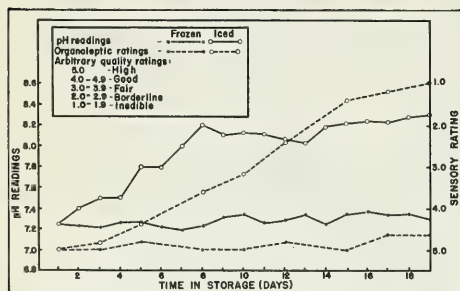


Fig. 1 - pH readings and sensory quality of shrimp during storage.

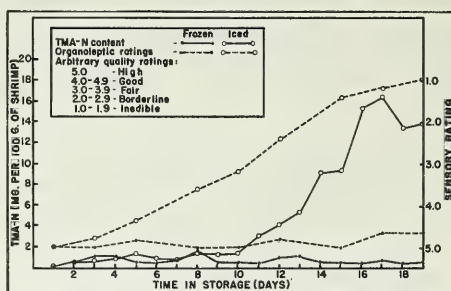


Fig. 2 - Trimethylamine nitrogen and sensory quality of shrimp during storage.

Trimethylamine Nitrogen Content: The trimethylamine nitrogen content remained about 1 milligram per 100 grams of shrimp until the 8th day. It then started to increase, and rose rapidly from the 12th to the 16th day, after which it leveled off (fig. 2).

¹/₁The picric acid turbidity test was conducted simultaneously and independently by Kurtzman and Snyder (1960).

Picric Acid Turbidity Test: The results of the picric acid turbidity test from 50-gram samples are presented in figure 3. All filtrates from the picric acid turbidity test were

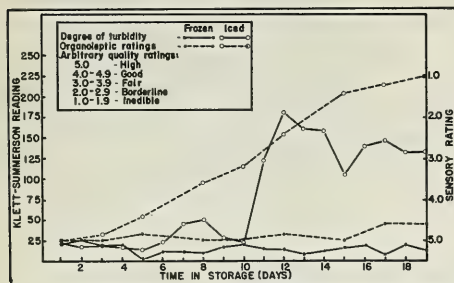


Fig. 3 - Picric acid turbidity and sensory quality of shrimp during storage.

and viscosity continued to increase until on the 13th day they were a brown, thick, lumpy gel.

FROZEN SHRIMP: During the entire experiment, the taste panel rated the frozen control shrimp as high or good quality, the pH of the homogenates remained within the range of 7.20 and 7.38, the trimethylamine nitrogen content averaged about 1 milligram per 100 grams of shrimp, filtrates of the picric acid turbidity test remained clear (figs. 1 to 3), and the homogenates did not change in color or viscosity.

CONCLUSIONS

The pH of homogenized, peeled, and deveined brown shrimp appeared to be useful as an indication of quality. Since changes in pH were gradual, definite pH ranges could be determined to correspond to quality variations as determined by a taste panel, especially during the first 8 days of iced storage.

Increases in trimethylamine nitrogen content of the shrimp did not become measurable until the pH and sensory values indicated a change from good to fair quality, and thus were of little value for the determination of changes in prime quality.

The picric acid turbidity test indicated chemical changes in the shrimp several days before the taste panel detected an appreciable quality difference.

The occurrence of high turbidity readings for the picric acid turbidity test filtrates coincided with the beginning of measurable increases of trimethylamine nitrogen content of the shrimp. It is therefore possible that trimethylamine nitrogen is a contributing factor to the formation of turbidity. The changes in pH progressed gradually with loss of quality of the shrimp, with no acceleration in the rate of change at the time the picric acid turbidities changed most rapidly. Because of the relatively high acidity of picric acid added to the slurry in the picric acid turbidity test, the contribution of pH of the shrimp to that of the filtrates is apparently negligible. It is quite possible, however, that the changes in pH occurring in the shrimp are essential to the formation of the substance(s) causing the turbidity.

The changes in pH and trimethylamine nitrogen content for peeled and deveined brown shrimp were of about the same magnitude as those reported in the literature for homogenates of shrimp in the shell. However, the leveling off of the trimethylamine nitrogen content after the 16th day may have been due to the removal of the shells and sand veins, and/or the removal of some of the decomposition products with the changing of the ice every other day.

Color and Viscosity of Homogenates:

The homogenates of the fresh shrimp were pinkish-white and of low viscosity. By the 6th day, they had changed to light brown and had become more viscous. Depth of color

Changes in color and viscosity of the shrimp homogenates were useful accessory tests of quality.

LITERATURE CITED

- BAILEY, M. E.; FIEGER, E. A.; and NOVAK, A. F.
1956. Objective Tests Applicable to Quality Studies of Ice-
Stored Shrimp. Food Research, vol. 21, pp. 611-
620.
- DYER, W. J.
1945. Amines in Fish Muscles. I - Colorimetric Determina-
tions of Trimethylamine as a Picrate Salt. Journal
Fisheries Research Board of Canada, vol. 6, pp. 351-
358.
- FIEGER, E. A. and FRILLOUX, J. J.
1954. A Comparison of Objective Tests for Quality of Gulf
Shrimp. Food Technology, vol. 8, pp. 35-38.
- HOOGLAND, P. L.
1956. A Convenient Arrangement for the Determination of
Trimethylamine in Fillets. Fisheries Research Board
of Canada, Technological Station, Halifax, Nova
Scotia, Circular No. 3.
- KURTZMAN, C. H. and SNYDER, D. G.
1960. The Picric Acid Turbidity Test--A Possible Practical
Freshness Test for Iced Shrimp. Food Technology,
vol. 3, p. 337.

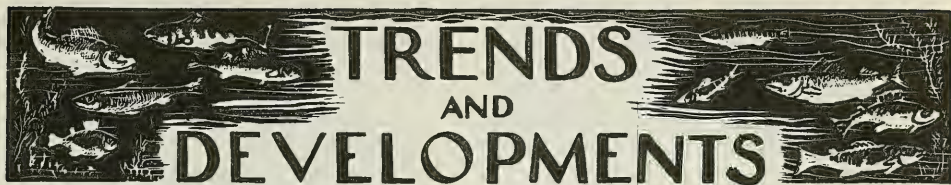


CLAM AND CHEESE DIP



- | | |
|-----------------------------------------|-----------------------------|
| 1 can (7 ounces) minced clams | 1 teaspoon chopped parsley |
| 2 packages (3 ounces each) cream cheese | $\frac{1}{4}$ teaspoon salt |
| 2 teaspoons grated onion | 3 drops tabasco |
| 2 teaspoons lemon juice | Canned whole cranberries |
| 1 teaspoon Worcestershire sauce | |

Drain clams and save liquor. Soften cheese at room temperature. Combine all ingredients except cranberries and liquor; blend into a paste. Gradually add about $\frac{1}{4}$ cup clam liquor and beat until consistency of whipped cream. Chill. Serve in a bowl. Garnish with cranberries. Makes about 1 pint of dip.



TRENDS AND DEVELOPMENTS

California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 61A9-Pelagic Fish: The coastal waters of California from Point Reyes to Santa Cruz Island were studied November 27-December 14, 1961, by the California Department of Fish and Game research vessel Alaska (1) to determine the amount of sardine recruitment from the 1961 spawning and to measure the population density of older sardines; (2) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies; and (3) to collect live sardines from Monterey Bay, and elsewhere north of Point Conception for blood genetic studies.

A total of 62 stations were occupied. Anchovies, 44 to 119 mm. long, were taken at five stations. No sardines, jack mackerel, or Pacific mackerel were taken or observed.

The Alaska scouted 479 miles between stations. Fish schools were very scarce throughout the area; only 8 anchovy schools were observed near Purisima Point. "Pin-head" anchovies were scattered at the surface between stations in the northeast end of Monterey Bay.

Generally poor weather hampered operations during most of the cruise. High winds and rough seas kept the Alaska in port for 4 nights and curtailed operations on 2 other nights. In addition, marginal weather conditions on most of the remaining nights limited the areas which could be worked. Sea-surface temperatures ranged from 51.31° F. at Point Buchon to 56.48° F. at El Capitan.

This cruise, together with cruises 61A5 through 61A8, formed the 1961 pelagic fish survey in California and Baja California. These cruises indicated that adult (age 1 and over) sardines were much less abundant than in 1959 and 1960. The percentage of stations

where adult sardines were taken dropped to about one-fifth of the percentage recorded in 1959 and 1960. The abundance and distribution of sardines of the 1961 year-class was about the same as that of the relatively weak 1960 year-class last year. Fish-of-the-year have been virtually absent from California waters during the last two years.

Anchovies and Pacific mackerel had about the same abundance in all areas as in 1960, while jack mackerel were less abundant.

Airplane Spotting Flight 61-14-Pelagic Fish: The inshore area from the United States-Mexican Border to Monterey Bay, Calif., was surveyed from the air (November 13-16, 1961) by the Department's Cessna "182" 9042T to determine the distribution and abundance of pelagic fish schools.

No coverage was possible north of Monterey Bay because of a persistent low cloud cover. Conditions were generally favorable south of Monterey Bay.

Only 25 schools, all anchovy, were seen during the flight. Eleven were close to the beach near Scripps pier, La Jolla; 5 were near the Oceanside pier; and 9 were scattered between Avila and Pismo Beach.

Airplane Spotting Flight 61-15-Pelagic Fish: The area from the United States-Mexican Border to Point Piedras Blancas, Calif., was further studied from the air (December 1-4, 1961) by the Cessna "182" 9042T to determine the distribution and abundance of pelagic fish schools. The weather was good throughout the area covered.

Only three small schools of anchovies (off the Coronado Strand) were seen south of Port Hueneme and no fish were spotted north of Ventura. A fairly large school group of anchovies was between Ventura and Port Hueneme. Despite very dirty water, resulting from the recent rains, 189 schools were

counted, all within one mile of shore. Good commercial catches of sardines were made in the same area two days before the flight, but no sardine schools were identified.

Airplane Spotting Flight 61-16-Pelagic Fish: The inshore area from Port Hueneme to San Diego and the offshore islands of southern California was surveyed from the air by the Department's Twin Beechcraft N5614D on December 13, 1961, to determine the distribution and abundance of pelagic fish schools.

Fair flying weather prevailed over most of the area; however, low coastal clouds prevented inshore spotting between Point San Mateo and San Diego. The sea was generally calm but there was considerable surface glitter.

Anchovies were abundant from Port Hueneme to Point Dume. Fifty-nine schools, including an unusually long one, were in this area. Several large schools were observed splitting up into small schools and then reuniting. The long anchovy school, off Point Dume, was approximately $1\frac{1}{4}$ miles long by 20 to 30 feet wide.

Only one sardine school, a large one, was observed. It was between Redondo Canyon and Malaga Cove in the southern end of Santa Monica Bay.

Off San Mateo Point about 100 porpoises, specific identity unknown, were observed in a closely-knit group.

About 150 Pacific pilot whales (*Globicephala scammoni*) were seen $1\frac{1}{2}$ to 2 miles offshore between Catalina Harbor and the east end of Santa Catalina Island. They were in pods of 15 to 20 animals. Sixteen pilot whales were noted between Santa Catalina Island and Palos Verdes Point. They were widely separated and apparently feeding. Only one gray whale was seen; it was in Kuyler's Cove, San Miguel Island.

Note: See Commercial Fisheries Review, Feb. 1962 pp. 14-15.

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DUNGENESS CRAB STUDIES CONTINUED:

M/V "Nautilus" Cruise 61N19a-d-Crab:
The coastal waters off central California from Bodega Bay to San Francisco were surveyed (Aug. 15-20, Sept. 12-17, Oct. 17-22, Nov. 14-19, 1961) by the California Department of Fish and Game research vessel

Nautilus (1) to collect market or dungeness crabs (*Cancer magister*) for growth studies using traps and a beam trawl; and (2) to determine time of occurrence and relative abundance of crabs in areas of operations.



Market or Dungeness Crab
(*Cancer magister*)

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with a 1-inch mesh net and seven 30-inch diameter crab traps of 1-inch mesh. The crab traps were baited with rockfish carcasses and squid and allowed to fish overnight. Beam trawling was done at each trap site. Each drag was usually for 20 minutes and covered $\frac{3}{4}$ mile. Exploratory beam trawling also was done at stations where traps were not set.

Excellent samples of juvenile market crabs were obtained from Bodega Bay using the 10-foot beam trawl.

In the Bodega Bay area, the crabs grew 16.6 mm. between August and November; males and females grew at approximately the same rate. In the San Francisco area, crabs grew 13.2 mm. during the same period with males growing slightly faster than females. Sex ratios were approximately equal.

Estimates were made of the number of juvenile crabs in the nursery area at Bodega Bay. In August there were approximately 6.5 million crabs in an area 1 by 3.5 miles. September estimates were much higher, indicating 27.2 million crabs in the area. An extreme concentration of crabs in one part of the bay caused the estimate to be high; in a single 20-minute trawl-haul 56,000 juvenile crabs were taken. No sampling was done in October, and in November only 0.8 million juvenile crabs were in the area. It is felt this reduction in the population was due to movements out of the nursery area.

Adult crabs were also taken in both the trawl and the traps; however, no increase in

the average size of the adult group was noted during the period. The extreme range in size of any age group has made it impossible to identify succeeding year-classes; however, with the abundance of juveniles it is hoped that their growth into the next year of life and possibly into the harvest will be followed.

Note: See Commercial Fisheries Review, Feb. 1962 p. 12-13.

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ROCKFISH TAGGING STUDIES CONTINUED:

M/V "N. B. Scofield" Cruise 61S8-Rockfish: The California Department of Fish and Game research vessel N. B. Scofield cruised (Nov. 24-Dec. 4, 1961) in the area of Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara Islands to (1) capture blue rockfish, Sebastes mystinus, by hook and line for tagging and for food and age studies; and (2) collect other species of rockfish for taxonomic studies.



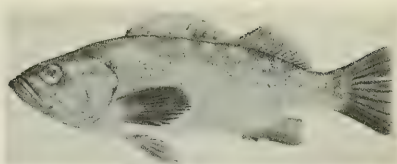
Blue Rockfish (Sebastes mystinus)

In all, 507 blue rockfish were tagged; most required deflation of the air bladder and a few had to have their stomachs pushed back into normal position after they were everted by the expanded air bladder. All fish were anesthetized in a 1:15,000 solution of MS 222.

Blue rockfish were caught in depths ranging from a few feet below the surface to almost 150 feet. The largest concentrations were around San Miguel Island where olive, vermilion, and copper rockfish were also quite abundant.

Thirty-four stomach and scale samples were obtained from the blue rockfish and 5 stomach samples were collected from lingcod, Ophiodon elongatus. In addition, several otoliths and partially digested small fish taken from the stomachs of the various rockfish were preserved for identification.

Copper rockfish, S. caurinus, vermilion rockfish, S. miniatus, black-and-yellow rockfish, S. chrysomelas, and juvenile olive rock-



Olive Rockfish (Sebastes serranoides)

fish, S. serranoides, were saved for taxonomic studies.

Eight rockfish--rosy, S. rosaceus (2), speckled, S. ovals (2), widow, S. entomelus (1), vermilion (1), copper (1), and black-and-yellow (1)--were successfully decompressed; these along with a sculpin, Scorpaena guttata, two sarcastic fringeheads, Neoclinus blanc-hardi, and one petrale sole, Eopsetta jordani, were kept in a live tank and delivered to Marineland of the Pacific.

Other species caught on hook and line included cabezon (Scorpaenichthys marmoratus), ocean whitefish (Caulolatilus princeps), kelp bass (Paralabrax clathratus), California sheephead (Pimelometopon pulchrum), Pacific sanddab (Citharichthys sordidus), gopher rockfish (Sebastes carnatus), flag rockfish (S. rubrivinctus), kelp rockfish (S. atrovirens), yellowtail rockfish (S. flavidus), honeycomb rockfish (S. umbrosus), starry rockfish (S. constellatus), bocaccio (S. paucispinis), and squarespot rockfish (S. hopkinsi).

Note: See Commercial Fisheries Review, Jan. 1962 p. 15.



Cans

SHIPMENTS FOR FISHERY PRODUCTS, JANUARY-NOVEMBER 1961:

Total shipments of metal cans during January-November 1961 amounted to 116,567 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 115,108 tons in the same period of 1960. Canning of fishery products in



January-November 1961 was confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were

down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

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ALUMINUM-ALLOY CANS:

A new method of producing thin, high-strength, lacquered aluminum-alloy sheets is said to make the material economically competitive with tinplate. It offers a considerable advantage over pure aluminum, which would be used more extensively for

ence Supply Agency in December 1961 than in the same month of 1960. The increase was 10 percent in quantity and 33.3 percent in value. As compared with the previous month, purchases in December 1961 were lower by 20.4 percent in quantity and 14.0 percent in value (table 1).

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, December 1961 with Comparisons

QUANTITY				VALUE			
December	Jan.-Dec.	December	Jan.-Dec.	December	Jan.-Dec.	December	Jan.-Dec.
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) .....				..... (\$1,000)			
1,876	1,706	23,450	22,917	1,109	832	12,470	11,839

Table 2 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1957-61

QUANTITY					VALUE				
1961	1960	1959	1958	1957	1961	1960	1959	1958	1957
..... (1,000 Lbs.) .....					..... (\$1,000)				
23,450	22,917	22,651	22,511	23,452	12,470	11,839	11,624	12,850	12,080

the manufacture of cans and boxes if its tensile strength were higher.

The process, developed by an aluminum company of Singen, Germany, consists of annealing and quenching hot-rolled coils of an aluminum alloy which contains about 1½ percent of both magnesium and silicon. The heat-treated strip is then allowed to age for 3 or 4 days at room temperature, so that its tensile strength is increased, before being cold rolled. A covering of epoxy resin is then applied which renders the material more suitable for deep drawing into cans, as well as offering protection against subsequent chemical attack. Drying and baking of this lacquer coating is carried out for 30 seconds at a temperature of 240°C. (464°F.) and it is reported that this procedure also helps to increase the tensile strength of the material. Source: *New Scientist*, vol. 9, no. 219 (1961), p. 215.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1961:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Military Subsistence

Total purchases for the year 1961 were up 2.3 percent in quantity and 5.3 percent in value. The greater increase in value was due to generally higher prices for fishery products in 1961 and to a lesser extent because the purchases consisted of higher-priced products. Fresh and frozen fishery products purchases from 1957 through 1961 have stabilized at around 22.5 million to 23.5 million pounds annually and the value of those purchases from \$11.6 million to \$12.9 million annually (table 2). However, in 1956, purchases went as high as 26.6 million pounds valued at \$13.4 million.

The average price paid for fresh and frozen fishery products in 1961 of 53.2 cents a pound was significantly higher than the 51.7 cents per pound paid in 1960 and the 51.3 cents a pound paid in 1959.

Canned: As occurred in December 1960, the only product purchased in December 1961 was canned tuna but the amount purchased was almost twice as much as in the same month a year earlier (table 3).

Table 3 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, December 1961 with Comparisons

Product	QUANTITY				VALUE			
	December		Jan.-Dec.		December		Jan.-Dec.	
	1961	1960	1961	1960	1961	1960	1961	1960
	(1,000 Lbs.)				(\$1,000)			
Tuna	423	47	7,081	3,610	235	24	3,315	1,613
Salmon	-	-	1,403	3,593	-	-	893	2,436
Sardine	-	21	131	147	-	9	63	61

Total purchases of canned fishery products in the year 1961 were 17.2 percent greater in quantity but only 2.6 percent higher in value than in 1960 (table 4). The smaller increase in value in 1961 was due to a 61-percent drop in canned salmon purchases. The quantity of tuna purchased in 1961 was 96.1 percent greater than the previous year, but canned sardine purchases were down 10.9 percent because the 1961 pack of canned Maine sardines was substantially less than in 1960.

Table 4 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1957-61										
Product	QUANTITY					VALUE ^{1/}				
	1961	1960	1959	1958	1957	1961	1960	1959	1958	1957
	(1,000 Lbs.)					(\$1,000)				
Tuna	7,081	3,610	3,698	5,884	2,711	3,315	1,613	1,672		
Salmon	1,403	3,593	1,085	3,336	3,111	893	2,436	737		
Sardine	131	147	1,051	253	215	63	61	177		
Total	8,615	7,350	5,834	9,473	6,037	4,271	4,110	2,586		
^{1/} Value prior to 1950 not available.										

^{1/}Value prior to 1959 not available.

Canned fish purchases have fluctuated rather widely during the past five years from a low of 5.8 million pounds in 1959 to a high of 8.6 million pounds in 1961. The purchases in 1961 have been the highest for the six-year period of 1956-1961.

Note: (1) Armed Forces installations generally make some local purchases not included in the data given; the actual total purchases are higher than reported above.

(2) See Commercial Fisheries Review, April 1961 p. 18.

VETERANS ADMINISTRATION REQUIREMENTS FOR CANNED FISH FROM NEW PACKS:

Early this year the Veterans Administration announced its estimated requirements of various canned food products, including fishery products.

Veterans Administration Requirements for Canned Fish from New Packs		
Canned Product	Can Size	Quantity (Dozen Cans)
Salmon, medium red or coho, skin and backbone on or removed	4 lb.	3,000
Salmon, red or sockeye	1 lb.	22,000
Salmon, red or sockeye, dietetic	No. $\frac{1}{2}$	9,000
Sardines	No. 1	5,000
Tuna, light meat, chunk, in veg. oil	4 lb.	6,500
Tuna, dietetic	No. $\frac{1}{2}$	9,100

Items listed are purchased by the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill.

Fish Bone Detection

AUTOMATIC BONE DETECTION AND REJECTION SYSTEM FEASIBLE:

It is now possible to design and fabricate a commercial unit capable of detecting potentially harmful or objectionable bones in one-half-inch-thick fish portions. This has been made possible by research supervised and financed by the U. S. Bureau of Commercial Fisheries. The same research also indicates that additional equipment can be fabricated which will be sensitive only to the bone signal as it appears on the oscilloscope. Such sensitized equipment could then be coupled to an automatic reject system, thus resulting in an automatic bone detection and rejection system.

Methods for automatically detecting bones in fishery products under normal production conditions have been under study by the Bureau's Technological Laboratory at Gloucester, Mass., since 1954. The most recent work in the field was conducted at the Barkley & Dexter Laboratories, Inc., of Fitchburg, Mass., under a contract from the Bureau. At that laboratory a model X-ray unit was fabricated to detect bones in fish meat under simulated production conditions. The unit was made from commercially-available electronic components and included an X-ray source, a fluoroscope screen, a revolving plastic turntable-sample holder to simulate fish plant production belt speeds of 12.5 and 25 feet per minute, and an electronic detection unit comprised of photoelectric cells wired to an oscilloscope. In operation, X-ray energy passing through the sample results in an image on the fluoroscopic screen. Changes in energy levels resulting from the presence of bone are relayed from the screen to the oscilloscope by the photo cells and result in distortion of the normal line trace.

The unit satisfactorily detected bones in frozen fish portions passing under the detector at belt speeds of 12.5 to 25 feet per minute. All bones greater than 0.012 inch in diameter, or about as thick as three sheets of typewriter paper, were detected in portions one-half-inch thick. However, the sensitivity of the unit decreased with increasing product thickness. Results in detecting bones in unfrozen fish fillets were not entirely satisfactory because of the smaller density contrast between the meat and bone.

Tests at the Bureau's Gloucester Laboratory have shown that bones less than 0.012

inch in diameter are harmless and not objectionable because they become soft upon cooking. Bones greater than 0.012 inch in diameter are either objectionable or potentially harmful.

Note: See Commercial Fisheries Review, October 1961 p. 14.



Fish Oils

EFFECT OF DIETARY FISH OILS ON BLOOD CHOLESTEROL:

A number of fish oils have been shown to have a cholesterol-depressant effect on hypercholesteremic rats. These include oils from menhaden, tuna, herring, dogfish liver, mullet, perch, and salmon. These and others such as cod-liver oil, sardine oil, and seal oil have been reported to be effective in patients and in experimental animals.

Experiments are being conducted to determine which components of fish oils are active as cholesterol depressants. Comparative analyses are being made on the effects of total unsaturation and of specific types of unsaturation in the tissue lipids of rats. The effects of feeding highly unsaturated products in the distribution of fatty acids in the tissues of both normal and hypercholesteremic rats are also being investigated. Lipids from cardiovascular tissues from rats fed marine oil esters are being fractionated and analyzed for their total fatty acid spectrum. This work is being done under a U. S. Bureau of Commercial Fisheries contract awarded in 1961 to the Hormel Institute, University of Minnesota.

Information on the effects of whole fish products is also important. Consequently, menhaden, silver salmon, ocean perch, and mullet were freeze-dried. The dried products, lipids from the dried products, and dried products with lipids extracted were fed to hypercholesteremic rats.

A paper ("Effect of Dietary Fats and Marine Oil Fractions on Cardiovascular Tissues," by James J. Peifer and W. O. Lundberg) presented at the Federated Societies for Experimental Biology in Atlantic City on April 14, 1961, reveals that previous studies by Peifer et al. established that linolenate, menhaden, and tuna oils are very effective cholesterol-depressant agents. Further studies were made of the effects of

feeding butter, margarine, corn oil, and marine oil fractions on tissue lipids of hypercholesteremic rats. Results show that cholesterol-depressant activities of tuna, menhaden, and dogfish-liver oils were due to their fatty acid components while their nonsaponifiables tend to aggravate the hypercholesteremic condition. All supplemental lipids promoted significant changes in higher polyene components of the myocardium and of the phospholipids from plasma and liver. Test lipids had less effect on cholesteryl ester polyenes. Studies suggest each tissue has its own specific polyenoic acid requirements. Polyene concentrates from menhaden oil were most effective in reducing blood cholesterol, the TC-TP ratio in plasma, and liver lipids. Lipid analyses by silicic acid microchromatoplates and GLC will be reported later.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

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INVESTIGATION OF CHEMICAL COMPOUNDS CAUSING FISHY FLAVORS AND ODORS:

Attempts are being made to determine causes for and precursors ^{1/} of fishy odors and flavors in marine oils. Low-molecular-weight aldehydes, ketones, acids, and amines are probably among the offenders. Methods have been developed to determine small amounts of these compounds. Derivatives of aldehydes, methyl ketones, and fatty acids containing 1 through 8 carbons were prepared, separated, and identified. This research is being done under a U. S. Bureau of Commercial Fisheries contract awarded in 1961 to the Hormel Institute, University of Minnesota, Austin, Minn.

Compounds containing nitrogen, phosphorus, or sulfur often have potent and obnoxious odors. Elemental analyses were made on odoriferous fractions of fish oil obtained from molecular distillation.

Potential precursors of odoriferous materials are being studied. Classes of compounds include long-chain amines, amides, nitriles, cyanates, thiocyanates, sulfates, sulfonates, phosphates, and phosphonates. Any compounds that were not commercially available were synthesized. Each was mixed with methyl esters of fish oil fatty acids and stored at room temperature. Any that develop fishy flavors and odors during storage will

^{1/}A precursor is a compound from which another compound is formed.

be analyzed to determine the classes of compounds formed in an attempt to detect chemical changes that have occurred.

Attempts are being made to learn why oxidation of fish oil fatty acids is different from oxidation of those in other oils and results in "fishy" odors.

Studies during the latter part of 1961 were done on the volatile components found in fish oils. Derivatives of carbonyl compounds often cannot be separated by ordinary methods, including paper chromatography. Separations of these were accomplished by gas chromatography. Derivatives were prepared and chromatographed on paper.

Since nitrogen compounds may contribute to odors of fish oils, fractions obtained from molecular distillations of commercial oils were tested for the presence of primary, secondary, and tertiary amines.

Column chromatography was used to fractionate fish oil. This was an attempt to segregate odors characteristic of the total oil and to determine whether the odors would be associated with some particular classes of lipids. A total of 24 fractions were separated, the odors described, and the classes of lipids present in the fractions are being characterized.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

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APPLIED RESEARCH ON EFFECT OF COMPONENTS ON HEALING OF SKIN LESIONS:

For years many people have believed that fish oils promoted healing of skin lesions and had a beneficial effect on the skin. Fish oils are added to a number of pharmaceutical and cosmetic products on the market, including creams, ointments, and sprays for burns. But information is not available in the scientific literature about the nature of or the use of fish oils in this field. Questions have been raised about the effects of tryglycerides, α -glyceryl ethers, vitamins A and D, hydrocarbons, and other compounds present in the unsaponifiable fractions of fish oils.

In order to clarify the effects of fish oils, a contract was awarded by the U. S. Bureau

of Commercial Fisheries to the Mayo Association and the Mayo Clinic in 1961 to study the action of certain fish oil compounds on the healing of skin lesions. The research involves producing second-degree ultraviolet burns on the skin of hairless mice and guinea pigs. An experimental oil and a control oil will be used. The experimental consists of bleached distilled tryglycerides from menhaden oil. The control oil consists of mineral oil with color and viscosity similar to those of the fish oils. The oils will be applied directly and as a cream. Clinical observations will be made, and if differences are observed in rate of healing or manner of healing, histological studies will be made.

Other components of fish oils such as unsaponifiable fractions and glyceryl ethers will be investigated.

Note: This contract research is supervised by the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.



Frozen Fish

MICROWAVE THAWING:

A study of the microwave thawing of frozen fish has been developed by Canadian and U. S. Bureau of Commercial Fisheries Gloucester Technological Laboratory scientists. The Canadians will catch inshore cod and brine-freeze them in pre-rigor and post-rigor conditions. The fish will be shipped to the Gloucester Laboratory where they will be thawed by a microwave unit.

The quality of the thawed fish will be evaluated by the Gloucester Laboratory's taste panel at bimonthly intervals. Aliquots of the bimonthly samples will be returned to the Canadians who will determine free fatty acids and protein dispersibility.

In addition to determining the feasibility of rapid thawing with microwaves, the results of the tests may settle the long-standing dispute between proponents of post-rigor plate freezing and the proponents of pre-rigor brine-freezing.



Gear

LOCATION OF DETACHABLE COD ENDS:

During rough weather, floating fishing gear or detachable cod ends with or without

radar reflectors cannot be seen on the radar screen. Undue delay in locating drifting cod ends deteriorates the quality of the fish.

A small transmitter fixed to the drifting cod end was found very satisfactory in quickly locating the cod ends. In spite of very bad weather during experiments off Greenland, it was possible to detect without any difficulty the drifting transmitter-fitted cod end up to 8 nautical miles away.

Small transmitters are manufactured in suitable designs to locate lifeboats or shipwrecked sailors. Similar transmitters are used for detecting floating whales. Source: Hansa, vol. 97, no. 8-9 (1960), p. 479.



Great Lakes Fishery Investigations

WHITEFISH SPAWNING SURVEY IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 10: Activities of the U. S. Bureau of Commercial Fisheries research vessel Siscowet (November 27-December 13, 1961) were in the Apostle Islands region, at localities east of Stockton Island, east of Madeline Island, north of Sand Island, east of Outer Island, east of Basswood Island, and in Presque Isle Bay. The studies dealt primarily with the spawning activities of pygmy whitefish, round whitefish, lake herring, and various forms of chubs. Although rough weather curtailed many of the scheduled activities, substantial amounts of life-history data and materials were collected.

Pygmy whitefish spawned in about 20 fathoms during the last week of November and round whitefish spawned in about 3 fathoms during the first week in December. Fertilized eggs were collected from both species for studies of embryonic and larval development but all of the pygmy whitefish eggs died soon after collection. Fertilized eggs were collected also from lake herring, chubs (Coregonus hoyi and C. kiyi). In addition, eggs of lake herring and chubs (C. hoyi) were cross-fertilized with milt from chubs (C. hoyi) and lake herring, respectively. The eggs will be incubated and the fry reared at the Northville Hatchery, in an attempt to discover characteristics which may aid in field identification of the various forms.

Scanning with the Siscowet's fish magnifier (a modified echo-sounder) confirmed earlier suggestions that lake herring may be pelagic spawners. Night scanning on November 28, 1961, during the peak of the spawning season revealed a heavy concentration of fish (presumably lake herring) at depths of 5 to 15 fathoms, in water 35 fathoms deep. A midwater trawl (converted from a 43-foot semi-balloon bottom trawl) towed 10 fathoms below the surface caught small numbers of lake herring and smelt. A 5-foot, 1/16-inch-mesh net (usually used for the collection of larval fish) which was towed at 20 fathoms, below the concentration of lake herring, caught small numbers of lake herring eggs, and opossum shrimp (Mysis). The eggs undoubtedly were drifting towards the bottom after being released in midwater. Stomachs from the lake herring and smelt caught in the midwater trawl were examined; all of the lake herring stomachs were empty and the smelt contained only mysids.

The concentration of fish, as observed by the fish magnifier, descended to slightly deeper levels during the night and by 10:00 p. m. most fish were at the 10- to 20-fathom depth. Heavy seas prevented further observations but commercial gill nets lifted from the bottom in the same area during the following morning yielded several tons of lake herring. The fish apparently migrated to the bottom sometime during the night, possibly to spawn. Some spawning, however, occurred at midwater levels.

Standard gill-net gangs (1- to 5-inch mesh) were set in three locations among the Apostle Islands. Chubs (Coregonus hoyi) and lake herring were the predominant catches in the East Stockton Island area at 63 fathoms and in the East Outer Island area at 85 fathoms. In the Presque Isle Bay area, catches consisted primarily of smelt at 25 fathoms. Two trawl tows in 20 fathoms east of Basswood Island yielded 27 juvenile lake trout, all of which were fin-clipped.

During the 1961 season the Siscowet captured 536 small (less than 17 inches long) lake trout in the Apostle Islands region. Of the 183 fish which were 2 years old or older, 159 (87 percent) were fin-clipped. Of 353 yearlings, 347 (98 percent) were hatchery-reared fish.

Surface water temperatures during cruise 10 ranged from 42.1° F. east of Stockton Island to 37.0° F. east of Outer Island.

The Siscowet was brought to her winter berth at Bayfield, Wis., immediately after the completion of the cruise.

Note: See Commercial Fisheries Review, Feb. 1962 p. 24.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-16 and "Miss Angela" Cruise MA-10: Concentrations of brown shrimp were located by the research vessels Belle of Texas and Miss Angela during cruises made during January 19-30, 1962. The concentrations were located by the Miss Angela in the offshore area from Freeport to Port Aransas, Tex., particularly in the 35-60 fathom depth range; and by the Belle of Texas in the offshore areas along the Louisiana coast particularly in the Trinity and Ship Shoal areas. This is the first promising concentrations of shrimp found by the research vessels operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory in Galveston, Tex., since the shrimp distribution studies were expanded in the Gulf of Mexico in September 1961.

The two vessels made a total of 27 tows and covered 9 statistical areas (FWS fishing grid zones 13 through 21). In each area one tow was made in each of three depth ranges--0-20 fathoms, 20-40 fathoms, and 40-60 fathoms. A 45-foot shrimp trawl was used.

The biggest catch occurred in area 19 where 73 pounds of heads-on brown shrimp per three hour tow was caught in the 40-60 fathom range and 19 pounds of shrimp was caught in the 20-40 fathom range. Only a negligible amount was caught in the 0-20 fathom range. The shrimp was all 15-20 count size in the 40-60 fathom range and 21-25 count in the 20-40 fathom range.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-DECEMBER 1961:

Landings of skipjack tuna in Hawaii during December 1961 were about 290,000 pounds, or about 55,000 pounds more than

in November and 60,000 pounds more than the 1948-60 average landings for the month.

The catch per successful trip of 5,234 pounds in December was twice that of November. There were 36 successful trips by Oahu boats in December as compared with 37 in November.

The landings during December were composed of 32.8 percent small (less than 8 lbs.), 24.8 percent medium (8-15 lbs.), and 42.4 percent large (more than 15 lbs. each) skipjack. This shows an increase in the proportion of large fish and a decrease in medium fish as compared to November.

Total estimated landings for January-December 1961 were 11.4 million pounds, about 1.6 million pounds above the 1948-60 average.



Industrial Products

MAJOR INDICATORS FOR FISH MEAL, SOLUBLES, AND OIL, DECEMBER 31, 1961:

Fish Meal Production and Imports				
Item and Period	1961	1960	1959	1958
.....(Short Tons).....				
<u>Production:</u>				
December.....	12,300	9,185	14,381	14,636
November.....	10,058	8,725	10,797	9,749
January 2/.....	2,713	2,433	3,095	2,075
Jan.-Dec. preliminary 3/	287,900	257,969	275,396	226,299
Jan.-Dec. totals 4/...	1/	290,137	306,551	248,140
<u>Imports:</u>				
December.....	1/	15,564	5,538	8,490
November.....	25,649	6,149	3,673	6,082
January.....	9,531	8,571	19,700	7,696
January-November...	194,214	115,997	127,416	91,862
January-December...	1/	181,561	132,955	100,352
Fish Solubles Production and Imports				
Item and Period	1961	1960	1959	1958
.....(Short Tons).....				
<u>Production 5/:</u>				
December.....	4,600	2,897	5,430	6,305
November.....	5,153	3,542	4,628	3,888
January.....	1,129	1,392	1,828	825
Jan.-Dec. totals.....	109,774	98,929	165,359	130,177
<u>Imports:</u>				
December.....	1/	60	420	5,180
November.....	3,649	282	3,089	867
January.....	219	214	954	473
January-November...	6,267	3,114	26,210	9,396
Jan.-Dec. totals.....	1/	3,174	26,630	14,567

(Table continued on following page)

Fish Oil Production and Exports				
Item and Period	1961	1960	1959	1958
	.....(1,000 Gallons).....			
Production:				
December	1,500	1,038	1,865	1,839
November	1,360	1,202	1,147	1,028
January	55	46	64	46
Jan.-Dec. preliminary 6/	33,400	26,690	24,418	21,957
Jan.-Dec. totals 7/...	1/	27,886	24,978	22,028
Exports:				
December	1/	2,108	2,611	383
November	190	1,952	813	2,037
January	1,793	276	898	825
Jan.-November	14,934	17,047	16,653	12,156
Jan.-Dec. totals	1/	19,155	19,264	12,539

1/ Not available.

2/ Does not include crab, shrimp, and misc. meals.

3/ Preliminary data computed from monthly data.

4/ Final annual data.

5/ Includes homogenized fish.

6/ Represents over 95 percent of total production. Data computed from preliminary monthly data.

7/ Final annual data.

Note: Data for 1961 are preliminary.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-November 1961: Based on domestic production and imports, the United States supply of fish meal for the first 11 months of 1961 amounted to 470,100 tons—84,100 tons or 22 percent more than in the same period of 1960. Domestic production was 5,500 tons and imports 78,600 tons greater than in the same period of 1960. Peru continued to lead other countries as the principal source of imports with shipments of 132,300 tons during the first 11 months of 1961.

The United States supply of fish solubles, including homogenized fish, during January-November 1961 totaled 111,400 tons—12,300 tons more than in the same period of 1960. Solubles and homogenized fish manufactured from domestically-caught fish made up 94 percent of the supply, while 6 percent of the supply was imported during the first 11 months of 1961.



Fig. 1 - Menhaden purse-seiner vessel at the dock of a reduction plant in Empire, La.

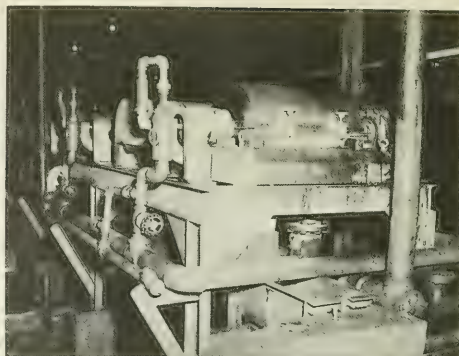


Fig. 2 - At a menhaden plant at Empire, La., a screw press is used to produce press liquor and press cake. From the press cake comes menhaden scrap and meal and from the liquor the oil is extracted as well as the fine solids.

U.S. Supply of Fish Meal and Solubles, January-November 1961 and Comparative Data			
Item	January-November 1961	1960	Total 1960
	..... (Short Tons)		
Fish Meal and Scrap:			
Domestic Production:			
Menhaden	237,286	212,541	218,423
Tuna and mackerel	19,189	23,963	26,499
Herring, Alaska	3,576	6,103	6,103
Other	15,504	27,399	39,112
Total production ...	1/275,555	1/270,006	290,137
Imports:			
Canada	35,861	29,588	30,982
Peru	132,321	58,152	68,156
Chile	10,738	17,990	21,183
Angola	1,543	360	888
So. Africa Republic	12,626	6,672	7,073
Other countries	1,488	3,235	3,279
Total imports	194,577	115,997	131,561
Available fish meal supply	470,132	386,003	421,698
Fish Solubles:			
Domestic production 2/	105,174	96,032	98,929
Imports:			
Canada	935	809	869
Denmark	28	1,858	1,858
Other countries	5,304	447	447
Total imports	6,267	3,114	3,174
Available fish solubles supply	111,441	99,146	102,103

1/ Preliminary. Based on reports from firms which accounted for 96 percent of the 1960 total production.

2/ 50 percent solids. Includes production of homogenized condensed fish.



Maine Sardines

CANNED STOCKS, JANUARY 1, 1962:

Distributors' stocks of Maine sardines totaled only 193,000 actual cases on January

1962. This was slightly less than half the available supply on January 1, 1961, of 2,300,000 cases. Shipments April 15, 1961, to January 1, 1962, amounted to 988,000 cases as compared to 1,271,000 cases for

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery's Stocks, January 1, 1962, with Comparisons 1/

Type	Unit	1961/62 Season				1960/61 Season				1959/60 Season			
		1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60	
Distributors	1,000 actual cases	193	202	208	215	267	233	277	172	197	252	235	
Cannery's	1,000 std. cases 2/	144	221	201	294	506	1,029	1,258	359	235	397	843	

1/ Table represents marketing season from November 1-October 31.

2/ 100 3/4-oz. cans equal one standard case.

1, 1962, a drop of 40,000 cases or 17 percent from the 233,000 cases on hand on the same date in 1961. Stocks held by distributors on November 1, 1961, amounted to 202,000 cases, and on July 1, 1961, amounted to 208,000 cases, according to estimates made by the U. S. Bureau of Census.

Cannery's stocks on January 1, 1962, totaled only 144,000 standard cases (100 3/4-oz. cans), a drop of 885,000 cases (86 percent) as compared with the same date in 1961. Stocks held by cannery's on November 1, 1961, totaled 221,000 cases and on July 1, 1961, totaled 201,000 cases.

The low level of current stocks reflects one of the shortest packs of Maine sardines in recent years. The total 1961 pack was 679,169 standard cases as compared with 1,970,000 cases in 1960. The Maine Legislator authorized a 1962 season of 13 months--December 2, 1961-January 1, 1963. The 1960 and 1961 seasons ran from April 15 to December 1, the usual legal season for packing canned sardines in Maine.

The pack of canned Maine sardines for the 1962 season which started on December 2, 1961, totaled 6,927 cases as of February 9, 1962.

The carryover of canned Maine sardines at the cannery's level on April 15, 1961, was 457,000 standard cases. Adding the 1961 season (April 15-December 1, 1961) pack of 679,000 cases to the carryover, gives a total supply of 1,132,000 cases as of January 1,

the same period a year earlier. The drop in shipments was due to the smaller amount packed in 1961.

Note: See Commercial Fisheries Review, Jan. 1962 p. 22.



North Carolina

"SEA BED DRIFTERS" RELEASED ALONG NORTH CAROLINA SHORE:

Several hundred "sea bed drifters" were released in mid-January 1962 in the area between Cape Hatteras and Cape Fear, N. C., by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Beaufort, N. C. This was done in cooperation with the Woods Hole Oceanographic Institution, Woods Hole, Mass., and the U. S. Coast Guard Cutter Chilulia, stationed at Morehead City.

Recoveries of the drifters will provide scientists with information on the ocean current pattern along the North Carolina coast. This information will be particularly valuable in studies of the distribution of menhaden eggs and larvae being conducted by the Menhaden Program at the Bureau's Pivers Island Laboratory. Waters along the North Carolina coast are known to be an important spawning ground for menhaden, but the means by which the larvae move, or are carried, from the ocean spawning grounds to the estuarine nursery grounds are not clearly understood. Information obtained from recoveries of the drifters will enable the scientists to follow the dispersal pattern of the young fish in relation to the current pattern.

All persons are urged to be on the lookout for sea bed drifters along the shore. The drifter consists of a 7-inch bright yellow plastic disc attached to a pink plastic stem. A 50-cent reward will be paid by the Woods Hole Oceanographic Institution for the return

Table 2 - Stocks of Canned Maine Sardines in Warehouses of Retail Multiunit Organizations, January 1, 1960-January 1, 1962

Item	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	1/1/60
Amount (1,000 actual cases)	56	53	53	56	71	53	52
Percent of total distributors' stocks (%)	29.0	26.2	25.5	26.0	26.6	22.7	22.1

of each drifter. A mailing tag attached to the top of the disc should be filled in, placed in an envelope, and mailed to the address shown on the tag.



Oregon

CHINOOK SALMON EGGS PLANTED IN COOS RIVER:

Planting of eggs from late fall-spawning chinook salmon into the South Fork of the Coos River was done by biologists and hatcherymen of the Oregon Fish Commission in January 1962.

There remains in the Coos system a remnant chinook population, but at the time when their spawning activities are conducted, water conditions are usually poor. Establishment of a later-spawning chinook run would take advantage of better water flows and more advantageous temperatures.

Nearly one-million eyed eggs were obtained from the California Department of Fish and Game's Nimbus Hatchery on the Sacramento system. The eggs are from late fall-spawning Sacramento system stock. They were buried in gravel in quantities of 5,000 per man-made redd. This closely approximates the number deposited by a single chinook.

Surplus silver salmon eggs from one of the Fish Commission's hatcheries were sent to California in exchange for the chinook eggs.

Studies have shown the stream flow and spawning gravel on the South Fork are sufficient to maintain runs if they can be established. The egg plants were made to conform as nearly as possible to natural conditions, with hatching estimated to start in about five weeks.

The success of this venture cannot be fully determined until the mature fish originating from the plants return to spawn.



Oysters

SHELLFISH MORTALITY CONFERENCE:

The Fourth Annual Shellfish Mortality Conference was held at Solomons, Md., the

week of January 22, 1962. Over 40 biologists and research administrators from marine laboratories along the Atlantic, Pacific, and Gulf coasts considered problems associated with the recognition, study, and control of oyster diseases. A large part of the time was devoted to reports on the epidemic caused by MSX.

A biologist from the Virginia Institute of Marine Service, Gloucester Point, Va., reported to the group that in Virginia the distribution of MSX had changed very little since 1960. No new areas were invaded, but there is no evidence that MSX has disappeared from any area once infested. Early summer infections produce late summer kills (about 40 percent in 1961). Late summer infections result in losses the following June and July.

Another scientific paper described and named the agent which causes a mortality of oysters on Seaside, Va. Previously known as SSO, it has been named *Haplosporidium costale*. Studied carefully by Virginia scientists during the past three years, this protozoan first appears in live oysters about February. Oysters die from it in May and June and then it disappears until the following early spring.



United States Commercial Fishery

Landings, 1961

Of the total United States near-record commercial fishery landings of 5.1 billion pounds, 21 percent (1.1 billion pounds) was taken from the coastal waters between Pascagoula, Miss., and Port Arthur, Tex.—only 300 miles apart as the crow flies.

This confirms conclusively the importance of conserving the environment of the Nation's inshore areas for the control, cultivation, and concentration of fisheries, according to the Fish and Wildlife Service's Bureau of Commercial Fisheries. The effects of altering coastlines, for industrial growth and urban development, must be assessed carefully for the protection of bays, inlets, and estuaries needed for fishery resource development. The items taken from the waters between Pascagoula and Port Arthur consisted largely of menhaden, unclassified fish for animal food, crabs, oysters, and shrimp.

Statistics compiled by the Bureau for 1961 reveal that the United States landings of fish, shellfish, and other aquatic products had an ex-vessel value of about \$364 million—about 200 million pounds and \$10 million more than in 1960 and only two percent under the record 5.3 billion pounds taken in 1956.

Increased landings of menhaden, tuna, jack mackerel, salmon, and king crabs accounted primarily for the increase in 1961. The record catch of menhaden was 45 percent of the total United States fishery landings; packers of

United States Commercial Fishery Landings of Certain Species, 1961 and 1960		
Species	1961 ^{1/}	1960
	.....(1,000 Lbs.).....	
Anchovies, California	7,400	5,059
Cod, Atlantic:		
Maine	2,100	2,897
Massachusetts	36,200	31,266
Other	5,400	6,218
Total cod	43,700	40,381
Crabs, all species	220,500	221,681
Haddock:		
Maine	2,600	3,834
Massachusetts	130,600	114,643
Other	100	220
Total haddock	133,300	118,697
Halibut 2/:		
Alaska	25,100	21,351
Washington	14,900	16,802
Total halibut	40,000	38,153
Herring:		
Alaska	48,600	77,913
Maine	51,500	152,327
Industrial fish, Me. & Mass. 3/:	41,900	43,798
Mackerel:		
Jack	98,300	74,945
Pacific	40,200	36,810
Menhaden	2,295,900	2,018,263
Ocean perch, Atlantic	134,200	141,433
Oysters, all species	57,800	60,010
Salmon:		
Alaska	263,700	207,100
Washington	29,400	16,528
Other	15,500	11,819
Total salmon	308,600	235,447
Sardines, Pacific	40,100	37,533
Scallops, sea (meats)	27,400	26,593
Shrimp (heads-on):		
South Atlantic & Gulf	155,000	236,939
Alaska	12,600	7,436
Washington	1,500	1,805
California	2,000	2,028
Other	700	1,244
Total shrimp	171,800	249,452
Squid, California	4,200	2,562
Tuna	333,600	298,203
Whiting:		
Maine	14,100	11,123
Massachusetts	87,700	87,348
Other	16,000	13,131
Total whiting	97,800	111,602
Total all above items	4,136,800	4,010,863
Other 4/	943,200	931,361
Grand total	5,140,000	4,942,229

1/Preliminary.

2/Dressed weight.

3/Excludes menhaden.

4/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

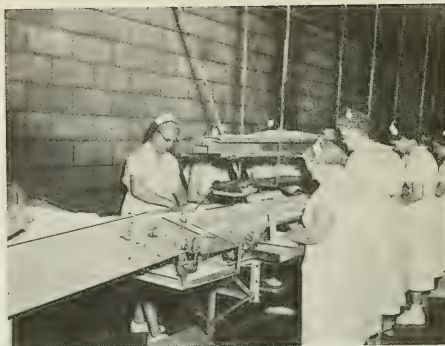


Fig. 1 - Breaded shrimp are hand-packed in cartons prior to freezing in a processing plant in Brunswick, Ga.

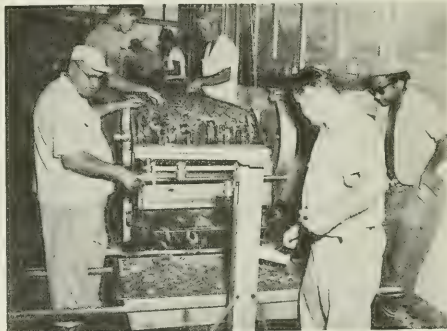


Fig. 2 - Weighing shrimp in a canning plant in Westwego, La. On the scale is a tared weighing bucket. Unsuitable shrimp and marine debris are removed as shrimp travels along the conveyor belt.

canned tuna put up the largest tuna pack in history. The catch of king crabs, sea scallops, and striped bass also hit new highs. Cod, haddock, anchovies, and Pacific mackerel also were taken in considerably greater volume, while large declines occurred in catches of herring (in both Maine and Alaska), sardines, shrimp, and whiting.

Prices for most items advanced during the year and, according to the "Wholesale Prices and Indexes for Edible Fishery Products," prices were 7.8 percent higher in December 1961 than in December 1960.

During 1961, the domestic catch for human consumption continued static, 17 percent below the 1948-1953 average. It was exceeded in quantity by that taken for industrial products, bait, and animal food. Imports of edible fishery products increased over 100 percent.

Note: See *Commercial Fisheries Review*, January 1962 p. 32.



U. S. Production of Fish Sticks and Portions, 1961

The United States production of fish portions in 1961 amounted to 60.1 million pounds valued at \$21.1 million and the production of fish sticks totaled 69.9 million pounds with a value of \$29.6 million. Compared with 1960, fish portions were 10.7 million pounds (22 percent) greater in quantity and

Table 1 - U.S. Production of Fish Sticks by Months and Type, 1961 1/

Month	Cooked	Uncooked	Total
..... (1,000 Lbs.)			
January	5,734	357	6,091
February	6,721	371	7,092
March	6,078	555	7,233
April	5,229	377	5,606
May	4,771	325	5,136
June	4,613	325	4,938
July	3,272	313	3,585
August	6,344	593	6,937
September	4,862	354	5,216
October	5,752	391	6,143
November	5,848	450	6,298
December	5,261	367	5,628
Total quantity 1961	65,085	4,818	69,903
..... (\$1,000)			
Total value 1961 1/	27,844	1,733	29,577
Total value 1960 2/	26,792	1,879	28,671

1/Preliminary.

2/Revised.

Table 2 - U.S. Production of Fish Sticks by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
..... (1,000 Lbs.)				
January	6,091	5,511	6,277	5,471
February	7,092	6,542	6,352	5,925
March	7,233	7,844	5,604	5,526
April	5,606	4,871	4,717	4,855
May	5,136	3,707	4,407	4,229
June	4,938	4,369	4,583	4,702
July	3,585	3,691	3,790	4,574
August	6,937	5,013	3,879	4,358
September	5,216	5,424	5,353	5,328
October	6,143	6,560	5,842	5,485
November	6,298	6,281	4,681	5,091
December	5,628	5,329	4,743	5,497
Total	69,903	65,142	60,378	61,011

1/Preliminary.

2/Revised.

Table 3 - U.S. Production of Fish Sticks by Areas, 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States ..	23	57,269	23	53,259
Inland and Gulf States ..	7	6,772	8	6,161
Pacific Coast States ..	10	5,862	8	5,722
Total	40	69,903	39	65,142

1/Preliminary.

2/Revised.

Table 4 - U.S. Production of Fish Portions by Months, 1961 1/

Month	Breaded		Total	Un-breaded	Total
	Cooked	Un-Cooked			
..... (1,000 Lbs.)					
January	684	3,472	4,166	137	4,303
February	756	3,940	4,696	206	4,902
March	1,522	4,389	5,661	170	5,831
April	798	3,555	4,353	144	4,507
May	848	2,944	3,792	110	3,902
June	552	3,352	3,904	159	4,063
July	730	3,146	3,876	110	3,986
August	609	4,252	4,861	126	4,987
September	1,342	4,262	5,604	165	5,769
October	1,591	4,959	6,550	233	6,783
November	1,000	4,580	5,580	233	5,813
December	1,011	4,052	5,063	152	5,215
Total quantity 1961	11,253	46,863	58,116	1,945	60,061
..... (\$1,000)					
Total value 1961	4,563	15,771	20,334	718	21,052
Total value 1960 ^{2/}	3,663	12,949	16,612	905	17,517
1/ Preliminary, 2/ Revised.					

1/Preliminary.

2/Revised.

Table 5 - U.S. Production of Fish Portions by Areas, 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States ..	26	34,567	24	29,028
Inland and Gulf States ..	12	24,016	11	19,184
Pacific Coast States ..	6	1,478	5	1,169
Total	44	60,061	40	49,381

1/Preliminary.

2/Revised.

Table 6 - U.S. Production of Fish Portions by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
..... (1,000 Lbs.)				
January	4,303	3,632	2,632	1,973
February	4,902	3,502	3,025	1,254
March	5,831	4,706	3,225	1,471
April	4,507	3,432	2,634	2,268
May	3,902	3,253	2,634	1,478
June	4,063	3,295	2,634	1,504
July	3,986	4,088	2,227	2,161
August	4,987	3,558	2,796	1,516
September	5,769	4,631	3,558	1,566
October	6,783	5,275	4,314	2,560
November	5,813	4,790	3,483	1,979
December	5,215	4,459	3,262	2,060
Total	60,061	49,381	37,147	21,790

1/Preliminary.

2/Revised.

\$3.5 million (20 percent) greater in value. Fish-stick production was up 4.8 million pounds (7 percent) in quantity and \$906,000 (3 percent) in value.

During 1961, 11.2 million pounds of breaded cooked and 46.9 million pounds of breaded raw portions were processed—97 percent of the 1961 total. Unbreaded portions accounted for the remaining 1.9 million pounds or 3 percent.

The 1961 fish-stick production consisted of 65.1 million pounds cooked fish sticks (93 percent) and 4.8 million pounds (7 percent) raw fish sticks.

The Atlantic Coast States led all areas in the production of both fish portions and fish sticks with 34.6 and 57.2 million pounds, respectively. The inland and Gulf States were next with 24 million pounds of fish portions and 6.8 million pounds of fish sticks. The Pacific Coast States made up the remaining 1.5 million pounds of fish portions and 5.9 million pounds of fish sticks.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, DECEMBER 1961:

During December 1961, a total of 20 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 16 in December 1960. The number issued first documents in 1961 was 3 less than in 1960. Also, there were 49 more documents cancelled for fishing vessels in 1961 than in 1960. This means that in 1961 there was a decline in the number of vessels documented for fishing.

Table 1 - U. S. Fishing Vessels 1/-Documents Issued and Cancelled, by Areas, December 1961 with Comparisons

Area (Home Port)	Dec.		Total	
	1961	1960	1961	1960
.....(Number).....				
<u>Issued first documents 2/:</u>				
New England	1	2	33	35
Middle Atlantic	1	-	12	18
Chesapeake	6	2	74	78
South Atlantic	4	1	44	47
Gulf	6	5	103	90
Pacific	2	5	149	146
Great Lakes	-	1	12	18
Puerto Rico	-	-	2	-
Total	20	16	429	432
<u>Removed from documentation 3/:</u>				
New England	2	-	20	22
Middle Atlantic	3	3	32	18
Chesapeake	-	3	27	21
South Atlantic	2	2	29	38
Gulf	7	6	103	90
Pacific	7	7	111	87
Great Lakes	-	1	17	13
Puerto Rico	-	-	-	1
Total	21	22	339	290

1/For explanation of footnotes, see table 3.

Table 2 - U. S. Fishing Vessels 1/-Documents Issued and Cancelled, by Tonnage Groups, December 1961

Gross Tonnage	Issued 2/	Cancelled 3/
.....(Number).....		
5-9	7	6
10-19	5	7
20-29	1	2
30-39	2	1
40-49	-	1
50-59	1	3
60-69	1	-
70-79	2	-
230-239	-	1
810-819	1	-
Total	20	21

1/For explanation of footnotes, see table 3.

Table 3 - Fishing Vessels--Documents Issued, 1938-1961

Year	First Documentation	Redocumentation	Total
.....(Number).....			
1961	409	20	429
1960	408	24	432
1959	479	34	513
1958	684	29	713
1957	601	18	619
1956	521	17	538
1955	418	23	441
1954	717	28	745
1953	729	25	754
1952	675	20	699
1951	780	28	808
1950	812	29	841
1949	1,002	42	1,044
1948	1,184	38	1,222
1947	1,300	48	1,348
1946	1,085	117	1,202
1945	741	4/	4/
1944	635	4/	4/
1943	358	4/	4/
1942	358	4/	4/
1941	354	4/	4/
1940	320	4/	4/
1939	357	4/	4/
1938	376	4/	4/

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 14 in 1961, 2 in 1960, and 4 prior to 1951. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

4/Data not available.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

SHRIMP IMPORTS, 1960-61:

United States Shrimp Imports (Fresh, Frozen Canned, and Dried), 1960-61		
Country of Origin	1961 ... (In 1,000 Lbs.) ...	1960
Mexico by Customs District:		
Maine	27	-
Massachusetts	-	52
New York	1	92
Charleston, S. C.	-	23
Florida	468	553
New Orleans	3,943	3,890
Galveston	-	140
Laredo	16,297	19,274
El Paso	2	27
San Diego	2,327	1,599
Arizona	55,797	47,673
Los Angeles	199	227
San Francisco	87	-
Oregon	-	25
Washington	3	4
Duluth	30	-
Michigan	-	5
Total Mexico	79,181	73,584
British Honduras	3	1
Greenland	59	26
Canada	249	332
El Salvador	8,093	6,699
Guatemala	744	259
Honduras	228	362
Nicaragua	803	266
Costa Rica	1,322	460
Panama	9,894	8,423
Trinidad	15	194
Bahamas	4	79
Cuba	-	80
Colombia	1,874	2,173
Venezuela	2,468	344
British Guiana	3,506	3,568
Surinam	447	381
Ecuador	4,684	4,193
Peru	358	256
Chile	538	738
Brazil	40	46
Argentina	20	61
Iceland	69	92
Sweden	15	2
Norway	72	110
Denmark	111	80
United Kingdom	59	-
Netherlands	-	1
France	5	-
West Germany	1	2
Belgium & Luxembourg	1	-
Spain	447	225
Italy	54	-
Turkey	4	-
Iran	1,953	1,226
Israel	-	2
Kuwait	193	147
Saudi Arabia	-	77
India	3,220	2,892
Pakistan	1,685	1,018
Indonesia	-	7
Philippines	6	24
Vietnam	114	97
Thailand	36	40
Korea	171	76
Hong Kong	14	2
Taiwan	-	3
Japan	1,823	2,949
Australia	36	128
New Zealand	12	26
Egypt	1,651	1,668
Grand Total	126,282	113,419

United States imports of all shrimp (fresh frozen, canned, and dried) from all countries for 1961 amounted to 126.3 million pounds as compared with 113.4 million pounds for 1960, an increase of 11.3 percent. Shrimp imports from Mexico for 1961 totaled 79.2 million pounds (up about 7.6 percent) as compared with 73.6 million pounds for 1960.

Some sharp increases and decreases in the United States imports of shrimp occurred from 1960 to 1961. Imports of shrimp from Venezuela increased from 344,000 pounds in 1960 to 2,468,000 pounds in 1961 (up 617.4 percent). Costa Rica increased its exports of shrimp to the United States by 187.4 percent in 1961 as compared with 1960, or from 460,000 pounds to 1,322,000 pounds; El Salvador's exports jumped 20.8 percent or from 6,699,000 pounds to 8,093,000 pounds; Panama increased its exports 17.5 percent or from 8,423,000 pounds to 9,894,000 pounds; and India's exports increased 11.3 percent or from 2,892,000 pounds to 3,220,000 pounds. On the other hand, shrimp imports from Japan in 1961 of 1,823,000 pounds were down 38.2 percent from the 2,949,000 pounds in 1960; and shrimp imports from Colombia declined 13.8 percent. During 1961 shrimp were imported into the United States from 51 countries as compared with 56 countries in 1960.

Note: (1) Most imported shrimp is frozen, except for some canned shrimp from northern Europe, Japan, and India; small quantities of dried shrimp from Japan and Hong Kong; and a small quantity of fresh shrimp from Mexico.

(2) See *Commercial Fisheries Review*, April 1961 p. 36.

* * * * *

UNITED STATES EXPORTS AND
RE-EXPORTS OF FROZEN SHRIMP
TO JAPAN, JANUARY-OCTOBER 1961:

With the increase in the prices of frozen shrimp and the light supplies, shipments to Japan slowed up considerably the latter part of 1961. Of the almost 8.3 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 10 months of 1961, 5.2

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp 1/ to Japan, January-October 1961					
Type of Product	July	August	Sept.	Oct.	Jan.-Oct.
	(1,000 Lbs.)				
Domestic	1,211	243	17	190	2,107
Foreign	1,137	254	40	130	3,129
Total	2,348	497	57	320	5,236

1/Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.

million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country purchased substantial quantities of shrimp from the United States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

Note: See Commercial Fisheries Review, Feb. 1962 p. 45.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty had not been announced as of early February 1962.

Imports from January 1-February 3, 1962, amounted to 4,526,521 pounds (about 215,500 std. cases), according to data compiled by the Bureau of Customs.

* * * * *

EDIBLE FISHERY PRODUCTS, DECEMBER 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during December 1961 dropped 13.4 percent in quantity and 7.4 percent in value as compared with November 1961. The decline was due primarily to smaller imports of frozen fillets (groundfish and other types), canned tuna in brine, fresh and frozen salmon from Canada, canned sardines in oil and not in oil, canned salmon, canned crab meat, and shrimp.

Compared with the same month in 1960, the imports in December 1961 were up 12.2 percent in quantity and 26.2 percent in value. The increase in value was due to the higher prices for nearly all imported fishery products. The general increase came about because of more imports of all types of frozen fillets, shrimp, scallops, and canned sardines. These increases were offset somewhat by declines in the imports of frozen and

canned tuna, and canned salmon. The increase in canned sardines was due to the light supplies in the United States because of substantial drops in the packs of Maine and California sardines in 1961.

U. S. Imports and Exports of Edible Fishery Products, December 1961 with Comparisons						
Item	Quantity		Value			
	Dec.		Dec.		Year	
	1961	1960	1961	1960	1960	1960
. (Millions of Lbs.) . . (Millions of \$) .						
Imports:						
Fish & Shellfish:						
Fresh, frozen, & processed ^{1/} . . .	87.4	77.9	1,010.4	31.3	24.8	304.8
Exports:						
Fish & Shellfish:						
Processed only ^{1/} (excluding frozen & frozen) . . .	4.6	4.8	48.7	1.3	2.0	19.2
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.						

United States exports of processed fish and shellfish in December 1961 were up 19.3 percent in quantity but dropped 31.6 percent in value as compared with November 1961. Compared with the same month in 1960, the exports in December 1961 were down 3.8 percent in quantity and a substantial 35.0 percent in value.

The substantial drop in value reflects the sharp decline in 1961 exports of canned salmon, canned sardines, and canned shrimp. Lack of adequate supplies was principally the reason for the drop.



Wholesale Prices, January 1962

In spite of seasonally severe weather in the North Atlantic fishing grounds, January 1962 landings of fish in New England were the heaviest since 1958. The slight drop (0.4 percent) in wholesale prices from December 1961 to January 1962 as reflected by the wholesale index for edible fishery products was almost entirely because of lower fresh fish prices in New England. The drop in fresh fish prices, however, was offset by higher prices for nearly all processed fishery products represented in the index. Compared to a year earlier, January 1962 wholesale prices for fishery products were 9.2 percent higher, again because of higher prices for frozen and canned products.

With heavier supplies of fresh fish landed in New England ports, the subgroup index for drawn, dressed, or whole finfish dropped 28.6 percent from December 1961 to January 1962 and was 19.1 percent lower than in January 1961. From December to January, prices dropped for fresh drawn haddock at Boston by 28.6 percent and fresh yellow pike at New York City by 11.0 percent, but rose for frozen Western halibut at New York City by 5.2 percent and Lake Superior whitefish at Chicago by 17.5 percent. Stocks of frozen halibut in January this year were substantially lower than a year earlier. Compared to a year ago, January 1962 prices for all products under the drawn finfish subgroup were down except for frozen halibut at New York City (up 24.4 percent) and whitefish at Chicago (up 2.1 percent).

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Jan. 1962	Dec. 1961	Jan. 1962	Dec. 1961	Nov. 1961	Jan. 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					143.0	143.6	141.1	130.9
Fresh & Frozen Fishery Products:					157.6	158.9	156.6	146.2
Drawn, Dressed, or Whole Finfish:					156.1	163.8	153.0	162.7
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.14	101.3	141.8	98.5	125.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.37	.36	115.5	109.8	106.3	92.8
Salmon, king, lge., & med., drsd., fresh or froz.	New York	lb.	.86	.86	103.8	103.8	103.0	202.2
Whitefish, L, Superior, drawn, fresh	Chicago	lb.	.74	.63	183.5	156.2	204.6	173.8
Yellow pike, L, Michigan & Huron, rnd., fresh	New York	lb.	.57	.64	132.5	148.9	111.4	152.4
Processed, Fresh (Fish & Shellfish):					164.8	161.5	158.8	145.9
Filletts, haddock, sml., skins on, 20-lb. tins.	Boston	lb.	.36	.32	122.5	107.2	115.7	132.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.94	.92	148.5	144.6	138.3	118.5
Oysters, shucked, standards	Norfolk	gal.	7.88	7.88	194.9	194.9	194.9	185.6
Processed, Frozen (Fish & Shellfish):					134.4	133.7	133.9	116.0
Filletts: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	100.8	100.8	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	103.6	103.6	109.9	109.9
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.31	132.9	124.9	120.8	118.8
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.92	.92	141.2	141.2	138.1	107.2
Canned Fishery Products:					122.1	121.9	121.8	109.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	143.5
Tuna, lt. meat, chunk, No. 1 1/2 tuna (6-1 1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	87.6	87.6	87.6	79.3
Sardines, Calif., tom. pack, No. 1 oval (5 oz.), 24 cans/cs.	Los Angeles	cs.	5.15	5.00	120.2	116.7	114.4	91.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.31	12.31	131.0	131.0	131.0	90.5

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

Wholesale prices of the fresh processed products rose 2.0 percent from December to January. Shucked oyster prices at Norfolk held steady at the same level since November 1961, but prices for fresh haddock fillets were up 14.3 percent and for fresh shrimp were up 2.7 percent during that period. Fresh processed prices were 13.0 percent higher in January 1962 than in the same month a year earlier. During that period, because of substantially light production in the South Atlantic States, fresh shrimp prices at New York City were up 25.3 percent. In that period, oyster prices rose 5 percent because the oyster industry continued to experience very low production. Offsetting those decreases was a 17.7-percent drop in the prices of fresh haddock fillets at Boston because of heavier landings of haddock in January 1962.

Processed frozen fishery products prices this January were all higher than the previous month, with prices for frozen flounder fillets at Boston up 2.6 percent and frozen ocean perch fillets up 6.4 percent, but haddock fillet prices remained steady at the December 1961 level. Prices for this subgroup this January were up 15.9 percent from the same month a year ago. Prices for frozen flounder fillets were up 1.3 percent, ocean perch fillets were up 11.9 percent, and shrimp a substantial 31.7 percent. On the other hand, frozen haddock fillet prices at Boston dropped 5.7 percent because of larger supplies. Shrimp stocks continued to be substantially lower than a year earlier.

Canned fishery products prices from December to January continued to inch upward principally because of a 3.0-percent rise in the prices for California tomato-packed sardines, the pack of which through January 1962 was still considerably behind the light pack of a year ago. Compared to January 1961, canned fishery products prices this January were up 11.1 percent. Prices for canned pink

salmon at Seattle were up 1.8 percent, canned tuna at Los Angeles were up 10.5 percent, canned California sardines at Los Angeles were up 32.1 percent, and canned Maine sardines at New York City were up 44.8 percent. Canned Maine sardine supplies were very light and practically exhausted as of January because of the very light pack in 1961.



Virginia

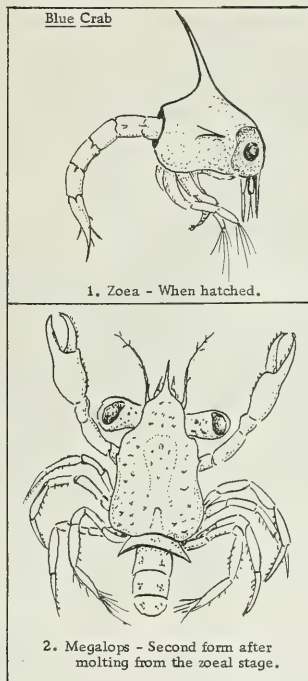
SCIENTISTS FORECAST DECLINE IN BLUE CRAB FISHERY:

Marine scientists predicted on February 5, that the blue crab catch in Virginia will be much below average for the winter of 1962



Blue Crab

and the spring of 1963. The forecast of a poor catch may be bad news to Virginia watermen and dealers who have seen wide fluctuations in the supply of crabs for over ten years. Since September of 1960, Chesapeake Bay watermen have found the supply of crabs exceeding even the bumper crop of 1950, which had been the largest in the history of this 80-year-old fishery. Now it appears there is little likelihood of a continuance of these good catches into 1963.



Scientists conducting crab research at the Virginia Institute of Marine Science (Virginia Fisheries Laboratory), Gloucester Point, Va., since 1955 have been making predictions of the crab supply a year in advance of the fishery. These predictions are based on extensive studies of recently-hatched crabs and are continually verified as the crabs grow to market size. First estimates are made from experimental York River trawl catches between Pages Rock and Bell Rock.

During the survey from September through November 1961, the number of small crabs was significantly lower than found in any previous year.

However, sometimes crabs spawn in large numbers in the fall. If this happened in the fall of 1961, the sampler would not collect any of the small crabs from that spawning until April of this year. When the spring survey is made, a more favorable forecast may be possible.

Although past predictions have been remarkably accurate, the technique is being improved by studying the relation between tidal currents and the number of small crabs caught. It has been found that samples taken during low slack tide are far below those at other stages of the tide. Predictions based on such samples would be too low.

The scientists plan to conduct similar surveys in the Rappahannock River this summer to make comparisons with York River catches.

The crab fishery between now and September is expected to be below average, for the catch will depend on legal-size crabs remaining in the Bay at the close of the winter dredge fishery plus other crabs which wintered over in the river. From September through November, pot fishermen will find their catch considerably below normal.





FOREIGN

International

NORTHWEST ATLANTIC FISHERIES COMMISSION

POLAND ADHERES TO NORTHWEST ATLANTIC FISHERIES CONVENTION:

The Government of the Polish People's Republic, as of November 21, 1961, has effected her adherence to the International Convention for the Northwest Atlantic Fisheries. (The Convention was dated at Washington, D. C., February 8, 1949, and entered into force July 3, 1950.) The adherence of Poland to the Convention was announced by the U. S. Department of State since the United States is the Depositary Government for the Convention. This adherence makes Poland a member of the International Commission for the Northwest Atlantic Fisheries. Adherence to the Convention was deposited on November 21, 1961.

The Twelfth Annual Meeting of the Commission, as decided by the Commission in its 1961 Annual Meeting and following an invitation by the U. S. S. R. Government, will be held in Moscow June 4-9, 1962. It will be preceded by meetings of various committees and advisers to panels.

Note: See Commercial Fisheries Review, September 1961 p. 61.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

SOCKEYE AND PINK SALMON FISHERIES REGULATIONS IN CONVENTION WATERS FOR 1962:

The following recommendations for regulations to control the sockeye and pink salmon on fishing in Convention waters of the North Pacific for 1962 were issued by the International Pacific Salmon Fisheries Commission on January 25, 1962:

United States Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

- June 24 to Aug. 5 - Closed to all net fishing.
- Aug. 6 to Sept. 9 - Gill nets open daily 7:00 p.m. to 9:00 a.m. (PDST) Monday afternoon to Wednesday morning.
- Purse seines open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday.

September 9 - Relinquish control.

East of William Head-Angeles Point Line:

- June 24 to July 22 - Closed to all net fishing except with nets having a mesh of not less than $8\frac{1}{2}$ inches extension measure and under regulation by the Washington State Director of Fisheries.
- July 23 to Sept. 9 - Gill nets open daily 7:00 p.m. to 9:00 a.m. Monday afternoon to Wednesday morning.
- Purse seines and reef nets open 5:00 a.m. to 9:00 p.m. Monday and Tuesday.
- September 9 - Relinquish control except in the waters westerly of a line projected from Lilly Point on East Point Roberts true south to the International Boundary.

Waters Westerly of a Line Projected from Lilly Point on East Point Roberts True South to the International Boundary:

Sept. 2 to Sept. 30 - Closed.

Canadian Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

- June 24 to Aug. 5 - Closed to all net fishing.
- Aug. 6 to Sept. 9 - Gill nets open daily 6:00 p.m. to 6:00 a.m. Monday afternoon to Wednesday morning.
- Purse seines open daily 6:00 a.m. to 6:00 p.m. Monday and Tuesday.
- September 9 - Relinquish control.

East of William Head-Angeles Point Line Including Areas 17, 18 and that Portion of Area 19 Lying Easterly of the Referenced Line but not District No. 1:

- June 24 to July 22 - Closed to all net fishing.
- July 23 to Aug. 26 - Open to net fishing 8:00 a.m. Monday to 8:00 a.m. Tuesday.

International (Contd.):

- Aug. 27 to Sept. 9 - Closed to net fishing in the easterly part of Area 19 specified above.
- Aug. 27 to Sept. 30 - Closed to net fishing in Areas 17 and 18.
- September 9 - Relinquish control in the easterly part of Area 19 specified above.
- September 30 - Relinquish control in Areas 17 and 18.

District No. 1:

- June 24 to July 22 - Open 8:00 a.m. Monday to 8:00 a.m. Wednesday.
- July 23 to Oct. 7 - Open 8:00 a.m. Monday to 8:00 a.m. Tuesday except that the Area Director of Fisheries may authorize the use of gill nets having a mesh of not less than 9 inches extension measure for linen nets and 9½ inches extension measure for synthetic fibre nets during any week of this period that a complete emergency closure is required for the protection of sockeye salmon.
- October 8 - Relinquish control.

Special Troll Restrictions:

Commercial fishing by hook and line or trolling shall be prohibited during the period from August 12 to October 7, except at such times that net fishing other than with spring salmon nets may be permitted, in any of Canadian Convention waters (Howe Sound not included) lying easterly and inside of a line projected from Gower Point at the northerly entrance to Howe Sound through Thrasher Rock Light thence in a westerly direction to the most northerly point on Valdez Island, thence following the easterly shoreline of Valdez Island to Vernaci Point thence in a straight line to Race Point on Galiano Island, thence following the easterly shoreline of Galiano Island to Mary Anne Point, thence in a straight line to Georgina Point Light on Mayne Island, thence in a straight line towards Point Roberts Light to the intersection with the International Boundary line thence following the International Boundary line to its intersection with the Mainland.

Note: See Commercial Fisheries Review, March 1961 p. 41.

PACIFIC SCIENCE CONGRESS

TENTH CONGRESS RESOLUTIONS
INCLUDE SEVERAL ON FISHERIES:

The Tenth Pacific Science Congress convened in Honolulu, Hawaii, August 21-September 6, 1961. Among the resolutions of the Congress, as approved by the Council of the Pacific Science Association and adopted by the Congress, were the following referring to fisheries:

It is generally recognized that the wise use of chemical pesticides is essential and that those developed and put into general use within the past two decades are more practical and more effective than ever before.

However, these new pesticides pose threats to man and to desirable plants and animals, including fish and wildlife, especially in large-scale control programs. RESOLVED that in all pest-control operations appropriate safeguards be provided to prevent injury to public health and to desirable plants and animals. All interests should be considered in deciding on when and where control is advisable; what materials, formulations, and methods of application are indicated; and what safeguards are necessary.

The milkfish (*Chanos chanos*) is an important food fish, cultured intensively in the Philippines, Taiwan, Hong Kong, Indonesia, Vietnam, Thailand, and India; and young *Chanos* are important bait for tuna long-line fishing. *Chanos* culture in brackish-water ponds is a well-established industry, expansion of which would greatly increase the production of the protein urgently needed for human nutrition throughout these areas; but expansion is deterred by the fact that the adult fish spawns in unknown areas of the Pacific and Indian Oceans and adjacent seas. Fry for stocking ponds must be collected along coastal shores, where fluctuation in the supply is unpredictable because of lack of information about the biology, migration routes, and spawning areas of the fish in its marine habitat. The Congress is aware of the efforts made by the Indo-Pacific Fisheries Council of the FAO to increase the general knowledge on the culture and biology of the milkfish and that it has compiled through its *Chanos* subcommittee a comprehensive report on the present status of research on this fish, stressing the inadequacy of present information. RESOLVED that the Congress recommends the establishment and financing--through an international commission or some other means, and in cooperation with the governments concerned and with I.P.F.C. (Indo-Pacific Fisheries Commission)--a research group equipped to study the biology and growth of *Chanos* in its marine environment from the fry stage to maturity and to locate their exact migration routes and spawning grounds. It is further resolved that copies of this resolution be transmitted to the heads of fisheries departments of all governments concerned and to the FAO and I.P.F.C. and other international agencies and scientific or educational institutions interested in the problem.

The marine turtle populations of the world constitute an important aesthetic and economic resource, which is disappearing, particu-

International (Contd.):

larly in Polynesia, though it could be increased to form an important protein food source, especially for the South China Sea area. RESOLVED that the attention of governments be drawn to the need for increased protection of marine turtles and for sound management programs wherever turtle populations are exploited for food. The Congress especially urges the need for international cooperative research programs to ensure survival and development of this resource in the Pacific Islands and in the South China Sea area.

Reports indicate that native peoples are dynamiting coral beds in Micronesia, New Caledonia, and other areas of the Pacific and are using poisons to take large numbers of fish. Both practices impair or destroy habitat that includes shelter and environment of food sources for the economic and subsistence species and result in dire consequences to the welfare and existence of island populations. RESOLVED that the Congress directs the attention of the Administration of the U.S. Trust Territory of the Pacific Islands, the Territorial Government of Guam, and other responsible agencies and appropriate governments to the prevalence of these abuses and urges that necessary measures be taken and appropriate legislation passed, with subsequent firm enforcement.

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

SOVIET-JAPANESE TECHNICAL TALKS END:

The month-long conference of Soviet and Japanese fishing experts, members of the Science and Technology Committee of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.), ended in Moscow on December 27, 1961, according to press reports.

The experts discussed the methods of evaluating salmon stocks, the current situation with regard to the stock of these important commercial fish in the northwestern Pacific, and the plans for fishing research for the coming year. The experts of both countries agreed that the salmon stocks, particularly that of its main species, the humpback (pink) salmon, continued to dwindle. Soviet scientists restated their view that this is due mainly to overfishing by Japanese fishermen who take almost two-thirds of the annual catch. The Japanese delegation attributed it

to natural causes. The Soviet side has suggested a number of measures to stabilize fishing and to conserve the salmon stock.

The Sixth Annual Meeting of the Commission convened in Moscow on February 26, 1962. (United States Embassy, Moscow, December 29, 1961.)

INTERNATIONAL NORTH PACIFIC FUR SEAL COMMISSION

FIFTH ANNUAL MEETING:

Senior fisheries administrators of four countries met in Ottawa February 7-10, 1962, to plan the future for the fur seals of the North Pacific Ocean which were once threatened with extinction, but are now being maintained at a healthy population level.



Fig. 1 - St. Paul Island of Pribilof Islands. Several fur seal harems at season when the harems are well-knit, before pups start to move out in large numbers.

The occasion is the fifth annual meeting of the International North Pacific Fur Seal Commission, composed of representatives from Canada, Japan, the U.S.S.R., and the United States. The Commission's Scientific Committee met from January 29 to February 6. The Committee reviewed the research program of the Commission and the preparation of a report to be submitted to the regular session of the Commission on February 7-10.

The story of the Commission demonstrates graphically how wise management through international accord has been successful in saving and expanding a valuable, renewable natural resource which might otherwise have become extinct.

The Commission was established under the provisions of the 1957 Interim Convention on

International (Contd.):

Conservation of North Pacific Fur Seals signed at Washington February 9, 1957. The Commission has as its major responsibility the investigation of the fur seal resources of the North Pacific Ocean. The objective of this investigation is to determine the measures which will make possible the maximum sustainable yield from these resources, with due regard for the relation to the productivity of other living marine resources in the area. In accordance with plans developed by the Commission, research agencies of the four participating Governments carry out research at sea. Research and management on the breeding grounds is conducted by the United States on the Pribilof Islands in the Eastern Bering Sea, and by the Soviet Union on the Commander Islands in the Western Bering Sea and on Robben Island in the Sea of Okhotsk.

The main fur seal herds are found on the Pribilofs, a group of five islands north of the Aleutian Archipelago in the Bering Sea. They are named for the Russian navigator Gerasim Pribilof who spent 18 years searching for the breeding grounds of the Alaskan seal herds. His search culminated in the discovery of these grounds on the mist-shrouded islands, of which the two most important areas are St. Paul Island and St. George Island. The island group, with the mainland territory of Alaska, was sold by Russia to the United States in 1867. Breeding grounds for smaller herds are located on the Commander Islands and on Robben Island.

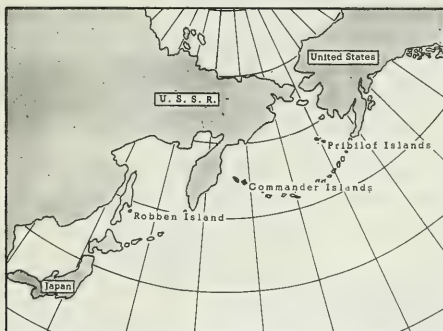


Fig. 2 - Breeding grounds of the northern fur seals: Robben Island (Kaihyōtō or Tyuleniy Island) off Sakhalin; the Commander Islands (Bering Island and Medny or Copper Island) at the Soviet end of the Aleutian chain; and the Pribilof Islands - St. Paul Island, St. George Island, Otter Island, Walrus Island, and Sea Lion Rock.

The early history of the Pribilof seal herds is interspersed with periods of indiscriminate killing and efforts to conserve the seals. The problem of protecting the herds from overexploitation was recognized during the early days of operation and in 1835, when they had dwindled to a dangerously low level, Russia placed a stringent ban on killing. Only males could be taken and females were thus protected. This had the effect of building up the herds which, at the time of the United States takeover of the islands, had been restored to a sizable number.

Under United States jurisdiction the Pribilof seal herds continued to be protected through a ban on killing females and a quota on the number that could be taken on the breeding grounds. However, a new and greater problem was posed in the expansion of pelagic sealing (killing at sea) by fishermen of other nations. This practice was rightly regarded as being both a wasteful and destructive method of taking the animals: wasteful because it resulted in the loss of many seals that were wounded and sank before they could be recovered; destructive because often it involved the killing of pregnant females which resulted not only in the loss of breeding stock but pups as well.

The conviction that proper management of the fur seal herds could only be conducted by a regulated kill of selected groups on the breeding grounds resulted, after an extended period of negotiation, in the signing of the North Pacific Fur Seal Convention in 1911, by Canada, Japan, Russia, and the United States. This convention remained in force until 1941. From 1942 until 1957 the Pribilof herd was protected by a provisional agreement between Canada and the United States.

The current convention, effective for a six-year period, was signed in 1957 with the four original nations participating. One of the main features of this convention is the prohibition it places on the killing of fur seals at sea except for certain specific numbers that may be taken pelagically by scientists of the member countries for research purposes. Also excepted from the pelagic ban are the operations of aborigines using primitive weapons.

In other respects, as well, the terms of the 1957 convention parallel those of the original treaty. They include a provision whereby Canada and Japan each receive 15

International (Contd.):

percent of the seal skins taken by the United States commercial operation on the Pribilofs and, subject to certain stipulations, a similar percentage of the U.S.S.R.'s commercial take on Commander and Robben Islands.

The effectiveness of this cooperative conservation program can best be judged by the fact that from a low point of less than 150,000 seals in 1911, the Pribilof seal herds have been increased to 1.5 million animals, a level which is being successfully maintained. The smaller herds of the Commander and Robben Islands are being built up to a level which will provide the greatest annual harvest year after year.

During the 1961 season the commercial take by the United States on the Pribilofs totaled 95,974 seals made up of 82,099 males and 13,875 females. The female kill forms part of the research and management program approved by the Commission at previous meetings. The Soviet take on the Commander and Robben Islands included 11,970 males and 63 females for a total of 12,033 animals.

The fur seals of the North Pacific are not to be confused with the common hair seals which are widely distributed throughout the world. The difference lies in the soft, velvety underfur that largely accounts for the fur seal's economic importance.

The North Pacific fur seals are mammals that live the greater part of their lives in the sea. The male seals, called bulls, are of considerable size and may weigh up to 700 pounds although 500 pounds is considered average. The females are much smaller, averaging 75 pounds and sometimes reaching a weight of 100 pounds.

The bulls arrive at the breeding grounds early in April or May and establish favorite places along the shore. The females reach the rookeries early in June and within a few days each gives birth to one pup. Mating takes place within a short time and another pup will be born approximately one year later.

The females are vigorously sought after by the bulls and are gathered in harems which may contain as many as 40 females. The bull jealously guards his harem and prevent any of the cows from straying and the

encroachment of other males. At one time it was thought that this vigil on the part of the male was constant throughout the period that the animals spent on the breeding grounds but recent research by Russian scientists on Robben Island indicates that the bulls may make short trips to sea and return to another harem.

As only females and pups are allowed in the harems by the bulls, the young males which have not yet attained maturity, or a harem, are segregated from the rest and band together away from the family groups. It is from these bands of "bachelors" that each year's quota is taken by the commercial killing operation, but a sufficient number is left to provide replacements for the older bulls. As a natural advantage to the propagation of the herds the elimination of these young bulls is desirable. They are very belligerent when they reach maturity at six years. If the breeding grounds were overcrowded with them, many young pups would be crushed to death in the numerous and tremendous battles between the young aspirants to a harem and the tough, older "beachmasters."

In their natural environment the seal herds face danger from various predators especially when, at the age of about four months, they venture into the stormy and treacherous waters of the North Pacific. Killer whales seem to be a principal predator and certain parasitic organisms also take a toll.

MARINE OILS

ESTIMATED WORLD PRODUCTION IN 1962:

World production of marine oils (including whale and sperm whale oils, and fish and fish-liver oils) in 1962 is expected to show only a slight increase over the record in 1961. Fish oil output in Peru and the Republic of South Africa will continue to expand, but much more slowly. Excluding the Antarctic, increased whaling operations by Japan and the Soviet Union will result in a slightly larger world output of sperm oil.

Table 1 - Estimated World Production of Marine Oils, 1957-62

Type	1962 ¹	1961 ²	1960	1959	1958	1957
	..... (1,000 Short Tons)					
Whale	450	450	425	415	435	440
Sperm whale ..	140	130	120	130	135	110
Fish (including liver) ...	680	670	565	575	515	485
Total	1,270	1,250	1,110	1,120	1,085	1,035

¹/Forecast.
²/Revised.

International (Contd.):

ATOMIC-PROPELLED MARINE RESEARCH VESSEL

The European Nuclear Energy Agency, OECD's cooperative atomic organization, met in Le Havre, France, on January 25, 1962, to look into the possibilities of building an atomic-propelled marine research vessel. Denmark was represented by an engineer from Burmeister & Wain's reactor division in Copenhagen, according to a report in Berlingske Tidende, January 22. A proposal is being made to build an atomic-propelled vessel, about 330 feet long, especially adapted and equipped for marine research and the education and training of young marine research scientists from many countries. The Danish oceanographer, the late Dr. Anton Bruun, a few years ago, proposed building an international marine research vessel. When he submitted the plans for an atomic-propelled research vessel for an opinion of the Atomic Energy Commission, shortly before his death, he was enthusiastic for the project.

It is now planned that a special committee of experts will be established to develop further the detailed plans like the committee which currently is working with Kockums Mekanska Verkstads AB in Malmö, Sweden, to prepare plans for an atomic-propelled bulk carrier.

The marine research vessel will be equipped with laboratories, and there is under consideration something wholly new--a large well in direct connection with the ocean, so that the scientists can conduct their research under much more favorable conditions than if they only were able to work along the sides of the vessel. (January 22 report from the Regional Fisheries Attache, United States Embassy, Copenhagen.)



Canada

BRITISH COLUMBIA SHUCKED OYSTER PRODUCTION, 1961:

British Columbia's shucked oyster production in 1961 was substantially higher than the previous year, but still considerably lower than the 92,741 Imperial gallons produced in 1959.

British Columbia Oyster Meats Production, 1960-61		
Imperial Measures	1961	1960
Half-pints	357,866	377,394
Pints	22,605	18,569
Quarts	39,235	24,977
Gallons	47,460	43,701
Total in Imperial gallons . . .	85,971	78,384

Prices to producers for shucked stock in December 1961 were as follows for Imperial measures: half-pints, C\$0.33-0.40; pints, \$0.55-0.75; quarts, \$1.00-1.65; gallons, \$3.15-5.25 (Prince Rupert prices not included). In December 1960 the price for Imperial gallons was \$3.00-5.25, and in December 1959 it was \$4.00-5.25.

The retail price of shucked oysters in Vancouver on January 15, 1962, for an Imperial half-pint was 50-55 Canadian cents as compared to 52-55 cents on January 15, 1960.

Note: See Commercial Fisheries Review, March 1961 p. 47.

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BRINE SHRIMP INDUSTRY IN SASKATCHEWAN:

According to several recent articles in the local press, a small specialized industry, known as the brine shrimp industry, which is devoted to the collection and packaging of tiny crustaceans and their eggs, is being moved from Great Salt Lake in Utah to Lake Manitou, Saskatchewan. These crustaceans, known as brine shrimp, are used as food for aquarium fish.

It has been said that the industry is moving from Great Salt Lake in Utah because the source there is drying up and only Saskatchewan appeared to have lakes with a sufficiently high saline concentration to replace it.

The first United States firm to begin similar operations in Saskatchewan built a plant at Watrous, near Lake Manitou, in the spring of 1961. The firm at the outset employed about 20 persons and expected to double the size of its operation the winter of 1961/62. Since the arrival of that company, the Saskatchewan provincial Fisheries Branch is said to have received inquiries from other firms in Eastern Canada and the United States.

Fisheries authorities believe that expansion up to \$500,000 a year may be expected

Canada (Contd.):

in this industry as there are other lakes in Saskatchewan which have a sufficiently high saline content to produce this type of shrimp. It has been estimated that Lake Manitou alone could produce 10.5 million pounds of brine shrimp annually without endangering future supplies. The company now in operation uses only about 0.1 percent of the Lake Manitou supply. This company is now producing both brine shrimp and eggs for feeding aquarium fish.

The report claims that frozen brine shrimp now have a retail value of approximately \$3.50 a pound and the shrimp eggs about \$80 a pound.

Both the company now operating and the company moving from Great Salt Lake expect to find markets for their products not only in Canada and the United States but also in West Germany and other countries where purchases are expected to expand with the increase in popularity of aquarium fish.

The industry expects to operate on a year-round basis and under this method the shrimp would be collected and frozen during the summer months. In the winter months it would be cleaned and packed for marketing.

According to information received from the Deputy Minister of Natural Resources in Regina, the press report describes generally the progress of the industry in Saskatchewan during the past summer, but some of the opinions expressed therein are purely generalizations. The possible yield figure, for example, was based on the calculated volume of Little Manitou Lake and a measurement of the abundance of shrimp taken during a sampling in 1960. He has stated that to date there is only one company involved in the development of the industry in the Province and that shipments thus far have been by truck on an experimental basis to the United States distributor. The main source of demand in the past has been the North American Aquarist. Small quantities have also been shipped to Western Europe. However, he anticipates that there will be a large market in government and private fish hatcheries in the future; in particular the commercial hatcheries in warmer latitudes which may very effectively use this food for young fish. There has been no confirmation of the market prices quoted in the newspaper re-

ports. (United States Consulate, Winnipeg, January 2, 1962.)



Ceylon

STATE CORPORATION FOR FISHING INDUSTRY PROPOSED:

The latest state corporation reported under consideration is one to handle all aspects of the fishing industry. According to press reports, this recommendation was made by the Parliamentary Advisory Committee of the Ministry of Agriculture, Lands, Irrigation and Power. The proposed corporation would assume the functions now performed by the Cold Storage plant at Mutwal which is run by the Fisheries Department and the Cooperative Fish Sales Union. It would also undertake deep-sea and trawler fishing.

The Fisheries Department has been making unsuccessful attempts to interest private firms into undertaking the exports of spiny lobster tails for which there is a ready market in the United States. The only large private company now expanding its facilities intends to specialize in tuna fishing. (Report of January 26, 1962, from the United States Embassy, Colombo.)



Chile

UNITED STATES \$5 MILLION LOAN TO CHILE FOR FISHERY PROJECT APPROVED:

A United States loan of \$5 million for a fishery project is included in the Inter-American Development Bank approval on December 21, 1961, of seven loans, totaling the equivalent of \$27,110,000, to finance four economic and social development projects in Chile.

The loan will finance 53 percent of the cost of establishing the fishing enterprise of the Empresa Pesquera de Tarapaca. The project will include the catching, freezing, and canning of fish and the manufacture of fish meal and oil. Fish to be caught include tuna, bonito, mackerel, sardines, and anchovies. Production will be primarily for export and is expected to produce net foreign exchange earnings of \$6 million a year.

Nine United States banks are participating in the early maturities of the loan for a total

Chile (Contd.):

of \$250,000 without the guarantee of the Inter-American Bank.

The loan, which will cover most of the foreign exchange costs of the project, will be used to purchase machinery and equipment for processing the catch and for a fishing fleet of 18 vessels. The company has signed a contract with a marine construction company of Seattle, Wash., for technical assistance and quality control during the early years of operation.

The loan will be granted for a term of 12 years and will bear interest of $5\frac{3}{4}$ percent annually, including the 1 percent commission allocated to the Bank's special reserve. Repayment will be made in 18 semiannual graduated installments, beginning three and one-half years after the signing of the loan contract.



Denmark

FISHING LIMITS DISCUSSED BY FISHERIES MINISTER:

The question of expansion of Denmark's fishing limits has faded into the background with respect to the coming negotiations on membership in the Common Market. But this is not tantamount to a loss of interest in the problem, according to newspaper reports of an interview with the Danish Fisheries Minister after a recent meeting in Copenhagen of the Economic Committee of the Nordic Council.

The Minister stated that Denmark will demand extension of its territorial waters and the fishing limits, if other countries decide on a similar expansion and limit foreign fishing rights. This applies especially to the countries where Danish fishermen have extensive fisheries. Extension of the present three-mile limit would be of importance to the Danish west coast fishermen who, naturally enough, wish to have the profitable common sole fishery to themselves.

Within Danish fishery circles, opinions on an extension of the fishing limits have been divided, according to the Minister. Many believe that fishing rights should be secured as far out as possible with respect

to the Danish coastal fisheries. But others, namely the fishermen who fish near the German and Norwegian coasts, take the view that Denmark should retain the old three-mile limit because it has the advantage that the Danish fishermen also can fish up to three miles from foreign coasts.

The Government has not received any demand for an expansion from the fishermen's side, and the Minister added that his impression is that the matter is quiet. There hardly will be any expansion in the foreseeable future, even if an existing agreement with the other North Sea countries (with the exception of Norway and Sweden) can be terminated with one year's notice.

With regard to the Faroe Islands, the agreement with the British Government is effective until April 1962. This agreement maintains the six-and-six principle so that there are certain areas between 6 and 12 nautical miles where, at certain times of the year, British fishermen cannot fish. The Government is considering whether it should give notice to terminate the agreement in order to effect a full 12-mile limit. Greenland also wants a 12-mile limit. The Government has taken no position yet but it probably will comply with Greenland's wishes.

In his report the Minister mentioned negotiations which have taken place with Norway on the Skagerak area, where Denmark has not been able to accept the Norwegian proposal because it feared an expanded Norwegian fishery in the area. It was the Minister's opinion, however, that agreement would be reached on this problem which, at the moment, is suspended. (January 3, 1962, report from the Regional Fisheries Attache, Copenhagen.)



Faroe Islands

FISHERY FACTORYSHIP PLANNED:

Faroeese ship owners are negotiating with a ship builder in Bremerhaven, West Germany, for the construction of a fishery factoryship of 1,500 gross tons which will require a capital outlay of 8 to 9 million kroner (US\$1.2-1.3 million), according to Danish newspaper reports.

The factory vessel would be the first of its kind for the Faroe Islands. It would ice

Faroe Islands (Contd.):

and quick-freeze fish and be equipped with filleting machines and fish meal and oil machinery. The catch would be handled below decks. Most of the fishing would be done in Greenland and Newfoundland waters. Delivery would be expected in 14 months. (United States Fisheries Attache, Copenhagen, report of January 2, 1962.)

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EXPORTS OF FRESH, FROZEN, AND SALTED FISH:

As a result of the Danish Government's decision to abolish on January 1, 1961, the approximately 4 percent premium for sales to the dollar area, exports of Faroese frozen fillets to the United States have decreased markedly, according to a newspaper report from Thorshavn. To Faroese exporters the premium amounted to about 14 øre per kilogram (slightly less than 1 U.S. cent a pound). Exporters are now concentrating on increased shipments to the United Kingdom where one firm is receiving substantial quantities of Faroese frozen fish products. Between 150 and 200 metric tons have been shipped to Grimsby in the past month. Exports of fresh fish to the British market also increased considerably in 1961.

Of the 1961 production of 110,000 barrels (11,000 metric tons) of salted herring, 80,000 have been sold on the Danish and Swedish markets, and East Germany has finally agreed to take 20,000 barrels. Faroese export circles hope that Danish and Swedish importers will buy the 10,000 barrels remaining unsold. (United States Fisheries, Attache, Copenhagen, report of December 28, 1961.)



German Federal Republic

FISH OIL MARKET:

According to the leading local fish oil importer, sales of imported oils in West Germany during December 1961 continued to be sluggish, in view of adequate stocks in the hands of margarine manufacturers. The one large British firm which has branches in West Germany has reportedly continued to limit its fish oil purchases to small exploratory transactions. These factors have had a depressing effect on price levels.

The price of United States menhaden oil has decreased from about US\$120 per metric ton (5.4 U.S. cents a pound), c.i.f. Rotterdam, in early December 1961, to about \$114 (5.2 U. S. cents a pound) early in January 1962. The fish oil importer believes that the price of United States menhaden oil will not drop much further, because United States fish oil producers are reportedly increasing their sales in the United States and in Canada.

The price for Peruvian fish oil has declined from about \$116 (5.3 cents a pound) to \$112-113 a metric ton (5.1 cents a pound), c.i.f. Rotterdam, for prompt delivery. Contracts for delivery of Peruvian fish oil in April-May-June 1962 are being negotiated at about \$110 a metric ton (5.0 cents a pound).

German fish oil was quoted as of January 12 at \$112-118 a metric ton (5.1-5.3 cents a pound) ex-factory. (United States Consulate, Bremen, January 12, 1962.)

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FISH MEAL PRICES,
JANUARY 5, 1962:

Prices reported at Hamburg Commodity Exchange as of January 5, 1962, for fish meal delivered ex-Hamburg warehouse, or c.&f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton 1/	US\$/Short Ton
German	50-55	loco/prompt	640,00	145,15
"	55-60	prompt/Jan. 1962	650,00	147,42
"	60-65	January 1962	660,00	149,69
Peruvian	65-70	January 1962	682,50	154,79
"	65-70	February 1962	585,00	132,68
"	65-70	March 1962	565,00	128,14
"	65-70	Apr.-Aug. 1962	557,50	126,44
Angola	65-70	Jan.-Feb. 1962	680,00	154,22
Portuguese	50-55	prompt/Jan. 1962	625,00	141,75
Icelandic herring	70-75	prompt/Jan. 1962	737,50	167,26

1/Values converted at rate of 4.0 deutsche marks equal US\$1.

Note: "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

German Federal Republic (Contd.):

Since late November 1961, fish meal prices at the Hamburg Exchange have shown a marked increase. West German fish meal manufacturers and dealers assert that the price increases reflect increasing demand for fish meal not only in West Germany but also in other West European countries. Furthermore, these sources state that fish meal production in several important European fishery nations dropped significantly in 1961. In West Germany, for example, the output of fish meal in 1961 decreased about 22 percent to about 65,000 metric tons. Some sources hold that a more skillful manipulation of fish meal exports by the Peruvians to be partly responsible for the price increases. Others believe that dealers, who refrained from purchasing in view of the speculative elements introduced into the fish meal market in 1961, now find themselves in short supply and have begun rebuilding their stocks, thus creating what is believed to be a temporary increase in demand. (United States Consulate, Bremen, January 12, 1962.)

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GOVERNMENT AID FOR FISHING INDUSTRY:

The progressive deterioration in the financial position of the West German trawler trade has led to a strong plea for expanded government support. In response to a motion adopted by the Bundestag (Parliament), the West German Government has made an investigation and submitted its findings to the Bundestag.

In the first section of its report, the Government compares the status of the West German fisheries with those of other West European fishery nations and arrives at the conclusion that the West German fishery trade, the fourth largest in Western Europe and one possessing a high rate of productivity, like other European fisheries is undergoing structural changes with regard to fishing techniques, shifts in fishing grounds, and processing of fish aboard vessels. The Federal Government further finds that many foreign fisheries enjoy numerous advantages over the German fishing trade, such as more favorable geographical locations, less war loss, no postwar currency devaluation, higher government support, subsidies, tax privileges, more intensive research, protective trade barriers, etc. The Government re-

port emphasizes the extraordinary interdependence of the various sectors of the fish trade and the fact that the value of raw fish increases by an average of 265 percent in West Germany before it reaches the consumer. After describing Norwegian and British support of the fishing trade in some detail, the report points out that important West European countries subsidize their fisheries in order to maintain the basis for secondary industries, which apart from stimulating the economic life in coastal areas, in the final analysis yield taxes surpassing considerably the subsidies granted from government funds.

In assessing the importance of the fish trade within the national economy, the Government reports that a total of 18,300 firms in all sectors of the fish trade employ about 97,000 people and transact a DM 3.8 billion (US\$950 million) business per year. Smaller catches have reduced the share of West German fisheries in the over-all national fish supply from 83-89 percent in the years 1950-1958 to 75 percent in 1959-60. In view of its need for foreign fish supplies, the Federal Government actively supports the development of a liberal fish trade policy within the Common Market (EEC). It also expects that the Common Market will provide additional sales opportunities for the West German fish trade. The merger of the EEC with European Free Trade Association (EFTA) countries would create better conditions for the establishment of a common fishery policy, among other things, aimed at the harmonization of competitive conditions, the promotion of deep-sea fishing, improved cooperation in and coordination of production, and marketing, etc.

In an analysis of the present position of the West German deep-sea fishing trade, the Federal Government, although with a slight shift of emphasis, confirms the reasons for the financial deterioration of the trade advanced by the trade itself earlier in the year. In summary, these causes are: (a) loss of traditional fishing grounds due to the unilateral extension of fishing limits; (b) lower fish catches as the result of changing hydrobiological conditions; (c) high cost of designing and building new types of fishing vessels and adopting new catching techniques; (d) price decline in the fish meal and fish oil markets; (e) higher cost for maintaining and improving fish quality standards in view of the lengthening voyages of fishing boats and the outlawing of certain fish preservatives; (f) distortion of

German Federal Republic (Contd.):

competitive conditions caused by the subsidization of foreign fisheries and the extensive liberalization of fish imports by the Federal Republic.

In 1957, 85 percent of all trawler companies lost money and in 1958 about 50 percent of all firms operated in the red. Net earnings, before taxes, dropped from about 2 percent in 1959 to about 1 percent in 1960. According to the report, medium and long-term debts of the trawler trade currently amount to DM 150 million (\$37.5 million), of which DM 127 million (\$31.7 million) was obtained through commercial loans. Repayment plus interest require DM 28 million (\$7.0 million) annually.

The Government report also reviews the status of the West German lugger and cutter fisheries, which is found to be critical, partly because of the reasons that also led to a deterioration of the trawler trade, partly because of the special features of these fisheries, such as seasonal operations, overspecialization in catching fish for the reduction industry, inefficient marketing systems, slow adoption of new fishing techniques, and a progressive obsolescence of the lugger and cutter fleets.

The Government report on the status of the West German fisheries fails to meet the parliamentary instruction in one important respect, namely "to state whether the budgetary means for promoting the fisheries must be increased, or additional support is required."

Since the publication of the Government report, trade and Government officials have been cooperating in determining the extent of support necessary to tide the fisheries over their present ebb.

The Association of Deep-Sea Fisheries has submitted to the Government a detailed support program for five years, assuming that within such a period it will be possible to harmonize to a significant degree the competitive conditions among the major fishing nations of the EEC and the EFTA. The trade also requests that the extended support be granted equally to all firms, without regard to size or efficiency so as not to hamper a selective development of the trade. The

trade support proposal comprises the following annual expenditures:

	Million DM	US\$ 1,000
1. Subsidies (patterned after the English system) in the amount of 9 percent of the gross proceeds of all landings (possibly differentiated according to catching areas)	17.0	4,250
2. Support of amortization of DM 110 million (\$27.5 million) in ship mortgages	6.6	1,650
3. Subsidies to lower interest rates payable on DM 110 million (\$27.5 million) from 5 percent to 2 percent	3.3	825
4. Support for the construction of 10 new trawlers at DM 5 million (\$1.3 million) at 5 percent	2.5	625
5. Scrapping premiums of DM 400 (\$100) per GRT for 25 trawlers of 500 GRT (This amount would be reduced to 15 vessels in the second year and to 10 trawlers in the subsequent three years.)	5.0	1,250
6. Sales promotion (The support would match the amount borne by the trawler trade itself for this purpose.)	3.0	750
7. Exploration of fishing grounds: Charter of a commercial trawler until new government research vessel will be placed into operation	1.2	312
Total	38.6	9,662

The inclusion of the lugger and cutter fisheries in the above program would raise support requested under the items 1, 2, and 3 as follows:

1. From DM 17 million (\$4,250,000) to DM 25 million (\$6,250,000)
2. " " 6.6 " (\$1,650,000) " " 9 " (\$2,250,000)
3. " " 3.3 " (\$825,000) " " 4.5 " (\$1,125,000)

Hence, total support requested by the German fishing trade amounts to about DM 50 million (\$12.5 million), of which DM 25 million (\$6,250,000) would be for direct subsidies. (United States Consulate, Bremen, December 20, 1961.)



Guinea

MARKET FOR CANNED SARDINES:

Among the canned sardine and sardine-like products, only canned sardines are imported by Guinea. Imports of canned sardines in 1960 amounted to 241,000 pounds,

Guinea (Contd.):

valued c.i.f. Port of Conakry at 15,204,000 Guinean francs (US\$61,500), all from Morocco. This is a reduction of about one-third from the average imports of the three previous years. Data on imports for 1961 are not available. All imported sardines are packed in oil.

Canned sardines in Guinea are normally consumed only by the dwindling European community and a relatively small number of Europeanized Africans.

The import duty on all canned fish products is 50 percent of the c.i.f. value. It is doubtful that import licenses or exchange allocations would be granted for canned sardines of United States origin since Guinea has a bilateral trade agreement with Morocco in which canned sardines are included. (United States Embassy, Conakry, January 12, 1962.)



Iceland

FIVE FISH-FREEZING PLANTS FORM NEW EXPORT ASSOCIATION:

Five Icelandic freezing plants representing 5.2 percent of the Icelandic production capacity have left the Freezing Plants Corporation sales organization for a new export organization. The businessman heading the new organization has leased two of the plants and represents the three others as sales agent. Working largely through a group of firms in Great Britain, the businessman has already received licenses to export 3,000 metric tons of frozen fish at a reportedly higher price than that obtained by the two existing frozen fish sales organizations, the Samband and the Freezing Plants Corporation. The latter have hitherto controlled about 20 percent and 80 percent, respectively, of Iceland's frozen fish exports.

The Freezing Plants Corporation concluded contracts in January 1962 with a British firm for the sale of a large amount of frozen unskinned cod fillets at 8 kronur (about 18.6 U. S. cents) per pound. (United States Embassy, Reykjavik, January 11, 1962.)

NEW FISH PRICING BOARD ESTABLISHED:

On December 16, 1961, the Icelandic Althing passed an act which should make it possible to set fish prices more rapidly. A bill to establish a fish pricing board was introduced into the Althing on December 8, 1961, by the Minister of Fisheries. Main discussion centered on the extent to which representatives of the fishermen's unions should participate in fish pricing negotiations between the processors and the fishing vessel owners. In the past, the labor unions representing the fishermen have been suspicious of prices reached in negotiations between these two groups who are often the same people, as many fish freezing plants and fishing vessels are owned by the same organizations.

Normally, the fish price for the main January through mid-May fishing season is set by negotiations starting the end of December between the groups named, accompanied by charges from the fishermen's unions. Often these negotiations drag on well into the fishing season, leaving uncertainty and division, and sometimes holding up the opening of the main fishing season. The new act establishes a board to fix the minimum prices of all fish species sold for processing in Iceland as well as on those exported in fresh and unprocessed form. The board also obtains information on local fish prices and production costs and foreign market prices, and is instructed to base its pricing on market prices of fisheries products in foreign markets. It should reach agreement on fish prices for one year ahead, if possible, and never for a shorter period than a complete fishing season. The board is empowered to fix the prices for cod, haddock, and other white fish as well as for shellfish and herring. The board is organized in different ways depending on the type of fish involved.

A 12-member group is charged with determining prices for the white fish; 6 of these represent the fish buyers; 3 from the Freezing Plants Corporation, 1 from the Union of Icelandic Fish Producers (saltfish), 1 representing the plants within the Samband, and 1 representing the Union of Stockfish Producers. The following make up the 6 representing the sellers: 3 from the Union of Icelandic Fishing Vessel Owners, 1 from the Icelandic Federation of Labor, 1 from the Icelandic Seamen's Federation, and 1 from the Federation of Merchant Marine and Fishermen. The latter is the officers' union.

As for setting prices on herring caught off the north and east coasts, representatives of the sellers of fish will be from the same organizations in the same numbers, while the fish purchasers will be represented along the following lines: 1 from the Freezing Plants Corporation, 1 from the Samband, 2 from the Union of North and East Coast Herring Salters, 1 from the State Herring Reduction Plants, and 1 from the Union of North and East Coast Herring Reduction Plants. The same arrangement will apply for representation of sellers of herring caught off the south and west coasts, but the representation of the buyers will be as follows: 2 from the Freezing Plants Corporation, 1 from the Samband, 2 from the Union of South and West Coast Herring Salters, and 1 from the owners of herring reduction plants on the south and west coasts.

In the event that disagreement occurs within these boards in arriving at fish prices before the time specified^{1/} expires, the question is referred to a 5-member board of arbitration. This board is made up of 2 members from the fish sellers, 1 representing the Union of Icelandic Fishing Vessel Owners,^{2/} and the other from the seamen's unions. Two representatives from the fish buyers will sit on the board, of whom at least one shall be appointed by the aggrieved party. These four members of the board are expected to agree on a neutral fifth member of the board. However, if the board does not select a fifth member within two days, the Supreme Court is to appoint the fifth member of the board of arbitration. This board's decisions are then binding on a straight majority basis.

The pre-February 1960 fish pricing arrangement had left final fish price-fixing powers to the Government, following

Iceland (Contd.):

negotiations between the fishing vessel owners and processors. The Government then set the fish prices and paid the export subsidy required as a result of the unrealistic exchange rate. The economic stabilization program removed the Government from setting fish prices and wages.

Although the procedures voted into being in December 1961 should streamline the former cumbersome methods for arriving at landed fish prices and should allay some union suspicions of vessel owner-processor collusion, it will by no means guarantee an easy price fixing path. The Icelandic Federation of Labor demanded in late December 1961 that the seamen's share of the fish catch be increased from 29-1/2 percent to 34 percent, thereby opening up another aspect of the fish price question. (United States Embassy, Reykjavik, January 4, 1962.)

1/ The time permitted the fish pricing boards and board of arbitration for fixing fish prices has not yet been set, but will be the subject of a subsequent regulation.

2/ This member must be one without any interest in fish processing plants.

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FROZEN HERRING SALES:

With a glut of herring at the oil and meal reduction plants, Icelandic processors stepped up the freezing of herring. By January 6, 1962, the Freezing Plants Corporation had frozen 11,140 metric tons of herring from the South Coast winter catch. Of this, 3,250 tons had been sold to West Germany and 2,500 tons to Poland. Uncertainty prevailed regarding negotiations to sell the Soviet Union 5,000 tons because of good catches by that country's herring fleet. Rumania was interested in purchasing 1,000 tons, posing a problem of what Iceland could purchase in return. Both the Czechs and East Germans had also expressed interest in frozen herring, but their barter trade balances were already in bad balance.

The remaining frozen herring may well be sold in Great Britain or elsewhere in Western Europe. Further processing of frozen herring was expected to slow up because of the unwillingness of the banks to advance further operational credits until sales contracts have been concluded to cover the product. (United States Embassy, Reykjavik, January 11, 1962.)



Ivory Coast

JAPANESE-ITALIAN JOINT TUNA BASE PLANNED:

A large Japanese fishing company is reported to have entered into an agreement with an Italian firm to establish a joint tuna fishing base at Abidjan, Ivory Coast. Each company will invest 50 percent in the enter-

prise. The Japanese firm reportedly has submitted an application to the Japanese Fisheries Agency for approval of the venture. Detailed information regarding this joint fishing base is not available but apparently the construction of a large freezing plant at Abidjan for storing tuna is included in the plan. (A translation from the Japanese fishery periodical *Shin Suisan Shimbin Sokuho*, January 26, 1962.)



Japan

PRODUCERS RECOMMEND

100,000-TON QUOTA FOR

FROZEN TUNA EXPORTS TO U. S.:

The two subcommittees of the Export Frozen Tuna Producers Association, one responsible for exports from Japan proper and the other for transshipments, met separately on January 23 and 24, 1962, to draft recommendations governing exports of frozen tuna to the United States in 1962, according to the Japanese periodical *Suisan Tsushin* of January 25, 1962. The views of the two committees were:

1. Direct shipments from Japan proper:

a. Frozen tuna export quota to the United States for 1962 be set at 100,000 short tons. The Exporters Association is considering an annual export quota of 110,000 short tons, but indications are that frozen tuna exports to the United States in 1962 will only amount to about 95,000 short tons (direct shipments from Japan proper, 68,000 tons; transshipments, 27,000 tons).

b. Frozen tuna exports from Japan proper be allocated as follows:

Species	Recommended Quota	Present Quota
	.. (Short Tons) ..	
Albacore	30,000	32,500
Yellowfin	35,000	37,500
Total	65,000	70,000
Tuna loins	4,800	4,800

c. Existing methods of allocating the export quota (i.e. on the basis of past performance records, with reserves held for later allocation to those companies that rapidly consume their quota) be applied to albacore and yellowfin and that the unassigned quota be increased for tuna loins.

d. A special committee be appointed to study the joint sales system.

Japan (Contd.):

2. Transshipments:

a. Continuation of present system and restrictions.

* * * * *

TUNA PRICES TO CATCHER VESSELS
IN MOTHERSHIP FISHERY:

The Japanese Tuna Mothership Association, made up of Japan's three largest fishery firms, has substantially agreed on the following prices to be paid in 1962 to catcher vessels delivering fish to tuna motherships:

Species	Price	
	1962	1961
	(US\$ Per Short Ton)	
Albacore	189	176
Yellowfin, large	113	111
Yellowfin, medium	164	156

(Translated from Japanese periodical Suisan Keizai Shimbun, January 21, 1962.)

* * * * *

TUNA MOTHERSHIP COMPANIES TO
REQUEST LIBERALIZATION OF
FISHING RESTRICTIONS:

The three largest Japanese fishing companies which operate tuna motherships in the South Pacific Ocean are planning to submit a petition to the Fisheries Agency requesting: (1) elimination of restrictions on fishing grounds; (2) increase in catch quota; (3) liberalization of restrictions on catcher vessel sizes; (4) revival of use of portable vessels.

According to the three companies, the tuna mothership fleet presently consists of a total of 5 motherships and 196 catcher vessels. Although this represents an increase in the size of the fleet since the beginning of the tuna mothership-type fishery five years ago, the fleet operates on the same fishing grounds due to area restrictions imposed on it. As a result, fishing grounds are crowded and this lowers efficiency.

On the other hand, tuna long-line vessels operating out of base ports are not restricted in their movements and thus are able to operate on the best fishing grounds. Catcher vessels assigned to the motherships possess the same type of fishing license as do the land-based long-line vessels but they are not permitted this freedom of movement, merely because they are serving the motherships. Also, area restrictions placed on the motherships serve only to hamper their mobility, which is their unique characteristic. These restrictions should be abolished so as to permit tuna motherships to operate at 100-percent efficiency. (Tuna motherships are presently restricted to the following areas: North of the equator--area east of 170° W. longitude; equator to 25° S. latitude--area east of 170° E. longitude; and south of 25° S. latitude--area east of 160° E. longitude.)

As for increasing the catch quota, which was raised a year ago to 22,900 metric tons, the tuna mothership companies want the quota to be increased by another 4,000 metric tons or so this year, to 27,500 metric tons. They contend that as a result of the liberalization of the vessel

construction law (effective December 1960) permitting construction of larger fishing vessels, production of land-based tuna vessels in 1961 can be expected to increase nearly twofold over 1954 production, which amounted to about 180,500 metric tons. This is possible since the land-based tuna vessels do not have any catch limits imposed on them. Catcher vessels assigned to the motherships should also be allowed to operate at their full capabilities. Besides, the system of retiring fishing vessels for the purpose of augmenting catches is rather complicated and rather than rely on that method, an outright increase in catch quota is desired. (By retiring a fishing vessel of a certain size for a specified length of time, tuna motherships are permitted to catch a fixed amount of tuna beyond their quota allocation for each vessel taken out of the fishery.)

On the question of vessel size, tuna motherships cannot employ fishing vessels of over 200 tons gross. With bigger vessels being built all the time, the companies are experiencing difficulty in chartering fishing vessels. They want to see this restriction on catcher vessel size liberalized so as to permit utilization of catcher vessels up to 300 tons gross and scout ships up to 350 tons gross.

Concerning use of portable vessels, the tuna mothership companies want up to four portable vessels authorized per mothership. The portable vessels would be used for conducting tests on gear and for making resource surveys. (Translated from Japanese periodical Suisan Keizai Shimbun, January 21, 1962.)

* * * * *

CANNED TUNA SALES FOR
EXPORT TO UNITED STATES:

The Japan Canned Foods Exporters Association held a meeting of its Tuna Sales Standing Committee on January 12, 1962, to discuss the second sale of canned tuna in brine for export to the United States. The Committee decided to sell, at prevailing prices¹, 130,000 cases (No. $\frac{1}{2}$, 7-oz. 48's) of canned white meat tuna and 130,000 cases (No. $\frac{1}{2}$, 7-oz. 48's) of canned light meat tuna, totaling 260,000 cases, to be shipped to the United States by March 20. For the first sale, 100,000 cases of light meat tuna and 130,000 cases of white meat tuna had been offered.

The chairman of the Tuna Sales Committee stated at the meeting that the packers wanted to raise export prices but he explained to them the difficulty of increasing prices under present market conditions, whereupon the packers agreed not to press for an increase in export prices. (Suisan Tsushin, January 13, 1962.)

¹/Prevailing f.o.b. Japan prices for canned tuna in brine for export to the United States are: \$9.95 per case for white meat tuna and \$7.70 per case for light meat tuna.

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EXPORTS OF CANNED TUNA
SPECIALTY PACKS:

Data compiled by the Canned Tuna Producers Association show that exports of spe-

Japan (Contd.):

cialty canned tuna products (other than those packed in brine and in oil) totaled 156,234 cases for the period April-November 1961. Exports to West Germany totaled 127,308

Japanese Exports of Tuna Specialty Packs, April-November 1961

Product	No. Cases
Vegetable tuna	89,538
Jelly tuna	41,489
Seasoned tuna	21,100
Curry tuna	3,150
Tuna in tomato sauce	139
Others	818
Total	156,234

cases and to the Netherlands 13,687 cases, according to a translation from the Japanese periodical Suisan Tsushin, January 27, 1962.

PENANG AND SINGAPORE PROPOSED AS TUNA TRANSSHIPMENT BASES:

The Japanese fisheries company which established the joint Japanese-Malayan tuna fishing and canning company located at Penang, Malaya, held a special stockholders meeting on January 23, 1962, according to translations from the Japanese periodical Suisan Tsushin (Jan. 24 & 29, 1962). Resignations of the officers and directors of the Japanese company were accepted following presentation of reports on the financial status of the Malayan enterprise. Stockholders agreed to place management of the joint Malayan-Japanese enterprise primarily under the control of the Mie (Prefecture) Tuna Cooperative Association, and also voted to redistribute a total of 34,000 unsubscribed shares to members of the Mie Tuna Association and other regional associations.

Members of the National Federation of Japan Tuna and Skipjack Fisheries Cooperative Associations reportedly agreed that the Malayan base should not be managed by the Mie Tuna Association alone but should be developed jointly by all regional cooperative associations. However, since the Mie Association will have to be depended upon heavily for financial support to overcome the present financial difficulties of the Japanese firm operating the Malayan operation, that Association's dominant position in that company's management remains basically unchanged.

In connection with the reorganization of the Japanese firm operating the joint Malayan-Japanese plant, opinions are being expressed that even if that company's Malayan plant should be permitted to export 36,000 cases of canned tuna to the United States, it will be difficult for that company to greatly improve its deficit operations; thus, this will serve to intensify the move to utilize both Penang and Singapore as bases for Japanese tuna vessels operating in the Indian Ocean.

Japanese tuna vessels which primarily operate in the Indian Ocean are estimated to number about 80-100. Of those, about 20 to 30 vessels would like to utilize Penang and Singapore as bases, and officials connected with the Japanese fisheries company operating the Malayan tuna plant are requesting that both Penang and Singapore be designated ports of transshipment so that tuna taken in the Indian Ocean can be exported to the United States from those two bases. At the present time, Japanese tuna long-liners operating in the Indian Ocean reportedly take on fuel at Singapore on their return trip to Japan. Design-

nation of Singapore and Penang as bases of transshipment will mean that those vessels can unload their catches at those ports and return directly to the Indian Ocean fishing grounds, without being required to make the long return trip to Japan to unload their catches.

Present plans call for dispatching 4 to 5 tuna (ice) vessels of 100-150 tons gross to Malaya. Hope is held that catches made by those vessels will be handled under a special quota, like that allotted to the Japanese tuna base at Espiritu Santo, New Hebrides Islands. However, this seems most unlikely since catches made by those vessels for export purposes are expected to be small.

RESEARCH VESSEL TO EXPLORE INDIAN OCEAN TUNA RESOURCES:

The Japanese Fisheries Agency's research vessel Shoyo Maru (602 gross tons) departed Tokyo on January 10, 1962, on an 80-day exploratory cruise to the southern Indian Ocean to investigate tuna resources. The Shoyo Maru expected to proceed first to Penang, Malaya, and then to Port Louis, Mauritius Island (east of Madagascar Island), from where it will survey the waters south of the fishing grounds now being fished by Japanese vessels to as far south as 40° S. latitude. The Shoyo Maru will not only conduct exploratory fishing for tuna but will also attempt to collect tuna larvae from waters around the Mauritius Island, which is believed to be the spawning area for albacore.

Research objectives are: (1) Study geographical distribution and abundance of important species of fish. (2) Study catch composition, catch quantity, and hook rate by fishing ground. (3) Collect data on water depth, water temperature, currents, etc., and relate their effects on fishing. (4) Conduct observations on fishing methods, water color, and vertical water temperature. (5) Collect measurements on lengths and weights of yellowfin, big-eyed, bluefin, and albacore tuna and spearfish. (6) Run stomach content analyses. (7) Collect data on gonad weights and determine sexual maturity. (8) Collect specimens.

At Penang, the Shoyo Maru will survey the fishing base operated by a joint Japanese-Malayan tuna canning enterprise, which reportedly is now faced with financial problems. (Suisan Keizai Shimbun, January 10, 1962.)

SHRIMP FACTORYSHIP OPERATION PLANNED IN BERING SEA IN 1962:

A large Japanese fishing company is planning to operate the Einin Maru (7,400 gross

Japan (Contd.):

tons) as a shrimp factoryship in the eastern Bering Sea again this year. Accompanying the factoryship will be 5 pairs of two-boat trawlers. Present plans call for sending the Einin Maru fleet to the waters off the Pribilof Islands in the eastern Bering Sea for five months beginning in April 1962.

Einin Maru's production target for 1962 is 300,000 cases of shrimp (24 8-oz. cans to a case). This target represents a fourfold increase of last year's production of 74,000 cases. In 1961, the Einin Maru also packed 5,400 metric tons of frozen shrimp but in 1962 it will concentrate on packing canned shrimp only. To achieve the 300,000-case target, the fleet will be increased by 4 trawlers to a total of 10 trawlers. New shrimp peeling machinery for installation on the factoryship has been purchased, and the production line will be increased by 2 to a total of 4 lines.

Reportedly, the Einin Maru operated in 1961 at a loss of 150 million yen (US\$417,000). This deficit is attributed to an unexpected decline in export prices and high operational costs amounting to about 700 million yen (US\$1.9 million). Expenses for the 1962 season are expected to total about 600 million yen (US\$1.7 million) and a profit of 100 million yen (US\$278,000) is anticipated.

Other major Japanese fishing companies have contemplated engaging in shrimp fishing in the Bering Sea. Indications are that they will not do so this year in view of the tight money situation prevailing in Japan. (Japanese periodical Suisan Keizai Shimbun, January 17, 1962.)

AFRICAN FISHERY INVESTMENTS SOUGHT:

The Japanese Ministry of International Trade and Industry (MITI) is planning to undertake a basic study of fishery investment possibilities in Africa to promote overseas fishery investments during the next Japanese fiscal year (April 1, 1962-March 31, 1963). This survey, which will be the fourth of its kind to be conducted by Japan since 1959 when Pakistan was first explored, will be assigned to the Japanese Overseas Fisheries Cooperative Association.

After completion of the survey, MITI hopes to work out a final plan in cooperation with the Overseas Cooperative Association. MITI is reported to be particularly interested in the West African coast for fishery investments in fiscal 1962. (Suisan Keizai Shimbun, January 11, 1962.)

TRAWLERS FISHING OFF SOUTH AFRICA:

A large Japanese fishing company, which is conducting trawl fishing off the coast of Las Palmas, Canary Islands, has extended its operations to South Africa. In the fall of 1961 it sent two trawlers, Taiyo Maru No. 68 (1,498 gross tons) and another 750-ton vessel, to the waters nearby Cape Town, South Africa. On January 16, 1962, the Taiyo Maru No. 62 was to begin fishing there. Another trawler, Taiyo Maru No. 61, which had been operating in the New Zealand waters, was also scheduled to proceed to South Africa, thus bringing the total number of the company's trawler fleet assigned to the fishing grounds off the coast of Cape Town to 4 vessels.

The firm's trawlers in the South African coast were catching large quantities of sea bream. All fish taken by the trawlers were to be shipped back to Japan, and as of mid-January 3,000 to 3,500 metric tons of fish had been shipped to Japan by means of commercial freighters. (Shin Suisan Shimbun Sokuho, January 17, 1962.)

The 1,500-ton stern trawler No. 10 Daishin Maru was scheduled to be delivered to another Japanese fishing firm on January 25, 1962. Delivery of the vessel marks the beginning of the firm's entry into the distant-water trawl fishery. The Daishin Maru will operate in West African waters. A sistership is scheduled to be completed in May 1962.

Specifications of the Daishin Maru are: Gross tonnage--1,500 tons; length--223 feet; beam--39 feet; engine--2,000-hp. Diesel; maximum speed--14.7 knots; and cruising speed--12.25 knots. (Suisan Keizai Shimbun, January 13, 1962.)

TWO STERN TRAWLERS BEING BUILT:

A large Japanese fishing company is constructing two 1,470-ton stern trawlers--Akebono Maru, Nos. 52 and 53--at a cost of

Japan (Contd.):

400 million yen (US\$1.1 million) each. Upon their completion, the trawlers will be dispatched to northern waters (Japanese term used for the Bering Sea, North Pacific, and the Okhotsk Sea area). If year-round operations in northern waters are not possible, the firm plans to fish off West Africa as well.

Specifications of the trawlers are: Length 236 feet; beam 39 feet; freezing capacity 54,185 cubic feet; and cruising speed 12 knots. (Shin Suisan Shimbun Sokuho, Japanese periodical, January 19, 1962.)

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GOVERNMENT ASKS FOR MORE MONEY FOR FISHERY REGULATION ENFORCEMENT:

The Japanese Fisheries Agency is requesting 146,788,000 yen (US\$408,000) in the 1962 budget (April 1, 1962-March 31, 1963) for fishery enforcement purposes. This represents an increase of 13,210,000 yen (US\$36,700) over the 1961 budget.

The Fisheries Agency plans to operate seven 450-ton-class patrol vessels and one 150-ton vessel to patrol the salmon fishery; assign 7 inspectors to the mothership-type king crab fishery, 24 inspectors to the mothership-type salmon fishery, and a total of 10 inspectors to the Eastern Hokkaido land-based salmon fishery and the Japan Sea pink salmon fishery.

In addition, the Agency plans to arrange to have landings in Japan of salmon processed by the salmon motherships inspected at time of landing, like last year, and station 5 inspectors at the fish ports--Kushiro, Nemuro, Akkeshi, Miyako and Hachinohe--which have been officially designated as ports of landing for the Eastern Hokkaido land-based salmon fleet. (Shin Suisan Shimbun Sokuho, January 19, 1962.)

* * * * *

GOVERNMENT LOANS FOR PROMOTION OF EXPORT TRADE:

The Japanese Ministry of International Trade and Industry (MITI) reportedly plans to increase and expand the export loan program to include exporters associations, importers associations, and import-export associations for the purpose of promoting ex-

port trade, according to a translation from the Japanese periodical Suisan Keizai Shimbun, January 24, 1962. To implement this program, MITI plans to submit a bill calling for the partial revision of the Commerce and Industry Central Banking Law at the next session of the Diet, whereby exporters associations, importers associations, and export-import associations will be included in the category of organizations eligible to receive financial assistance from the Commerce and Industry Central Bank. Organizations engaged partly in export and/or import but which are not identified as such by name will not be eligible for aid under this program.

Approval of this program has already been received from the Democratic-Liberal Party and MITI hoped to submit it to the Cabinet in January prior to presenting it to the Diet.

Agricultural and fisheries products will naturally be affected by this program, the implementation of which will mean that eligible associations engaged in handling agricultural and fisheries products will now have two sources of funds available to them during periods of depressed business conditions, the other being the Agriculture and Forestry loan fund. For this reason, MITI expects an expansion of trade in agricultural and fisheries products.

* * * * *

MORE MONEY FOR SALES PROMOTION OF FOOD PRODUCTS:

The Agriculture and Forestry Committee of the Japan Export Trade Promotion Association (JETRO) held a special meeting in Tokyo on January 26, 1962. The Committee reported on its trade promotion activities in 1961 for agriculture, forestry, and fishery products and discussed the 1962 budgetary requirements for promoting exports of those products, according to a translation from the Japanese periodical Suisan Keizai Shimbun, January 28, 1962.

It was stressed that as a result of the Government's policy to promote the national economy, demand in 1961 for canned tuna and frozen tuna continued good as evidenced by conditions in the United States, and the market remained stable. However, the strong demand for fish sausage and fish ham in Japan, coupled with shortage of raw materials for those products (of which tuna is one) has served to restrain exports of tuna. Also

Japan (Contd.):

high prices paid on the domestic market for raw tuna as a result of a strong demand for canning purposes may throw tuna export prices out of balance in the future. Bearing this in mind, JETRO plans to step up its overseas publicity activities in 1962 and hopes to ask the Government to give special consideration to the procurement of raw materials for the production of canned tuna.

JETRO plans to drastically increase its publicity expenses for 1962 to 41,114,000 yen (US\$114,000), an increase of 19 million yen (\$53,000) over the previous year's expenditures. Of that amount, JETRO plans to spend 10 million yen (\$28,000) for publicizing pearl products and 24,250,000 yen (\$67,000) for publicizing Japanese canned tuna and tuna-like products for export to the United States and, as a new undertaking, spend 5 million yen (\$14,000) for pearl publicity in West Germany. The remainder of the fund would be used for publicizing Japanese fresh fruits in Hong Kong, Europe, and the United States.



Malaya

JOINT JAPANESE-MALAYAN TUNA CANNING OPERATION AT PENANG:

The joint Japanese-Malayan tuna fishing and cannery operation at Penang, Malaya, is small and at present is operating in leased quarters. It is reported to be running at a loss. However, it has plans to build its own cannery and to expand production.

Fifty-one percent of the capital of the firm is Malayan, and the remainder is Japanese. The company was organized in 1959 with pioneer status from the Government of the Federation of Malaya. The firm began operations in February 1960. The company leases two canning plants; one is shared by another canned food company and the other is shared by another company. The refrigeration unit is owned by the tuna canning firm.

The tuna used by the cannery are caught in the Indian Ocean by a fleet of 4 Japanese fishing vessels, 2 of which are 100 tons, and the others are 150 tons. The former bring in catches of about 50 tons per vessel, and the latter about 80 tons. Approximately once a week one vessel will return to Penang with a catch. Three types of tuna are caught: albacore or white-meat tuna, yellowfin, and big-eyed; both of the latter are light meat. The average weight of the fish is 80 pounds. In addition, spearfish as well as black, white, and striped marlin are caught, but these are not canned nor is there any demand for them in Penang, so they are shipped to Japan.

Aboard the fishing vessel the fish are stored in refrigerated holds. The hatches are opened and the fish are hauled out in groups and swung over to the pier where the vessel is docked. The fish are hoisted. A team of young men then drag the tuna over to be weighed and loaded on to trucks. The trucks take the fish over to the refrigeration warehouse of the canning firm.

The tuna are stored in 3 refrigerated rooms where there is space for 200 long tons of fish and where the temperatures of the rooms are kept at -20 and -25° C. (-4 and -13° F.). These rooms are also used for the storage of sardines (fish of the sardine family) used by the Japanese fishing vessels for bait.

Processing of the tuna for canning is as follows: the tuna are taken from the refrigerators and thawed. Then wedges of meat about 2 feet long, and 6 to 8 inches thick at the widest part, are cut off and placed in wooden frames with wire bottoms. These are placed in steam ovens for cooking. When the meat is cooked, it is removed from the ovens and allowed to cool. Then the bones, dark meat, and skin are removed, and the cleaned tuna meat is put through a slicing machine which cuts it into slices about an inch thick. These slices are passed to girls who then weigh 187 grams (about 5.9 ounces) of tuna meat and place it on metal plates. These are passed to another group of girls who put the meat into 7-ounce cans which are imported from Japan. At another table, 2 girls are putting tuna fish flakes into cans. The weight of the cans is then checked, and they are passed on to have 2.5 grams of salt added and to be filled with cottonseed oil or soybean oil, or sometimes with tomato sauce. Next, the cans are passed on to the operator of a machine which puts tops on the cans. The sealed cans are then steamed for 1 hour and 20 minutes at 7-lbs. pressure and at 112° C. (233.6° F.). After that, the cans are removed, cooled, washed, packed 48 to a case, and sent to a warehouse where labels are attached and the cans stored.

The two canning plants used by the canning firm are rented. One employs approximately 60 persons, and there is a Japanese technician in charge of canning, another in charge of the fish meal manufacture, and a third in charge of tuna-liver oil extraction. At the other plant there are about 52 employees, including one Japanese technician. Ninety percent of the company's employees are women. The local employees are mostly Chinese, but there are a few Malays and Indians.

At the refrigeration plant, there is one Japanese technician in charge of the cold rooms, supervising the work of 6 locals, and another Japanese technician is in charge of the refrigeration machinery and is training 3 locals (a Chinese, a Malay, and an Indian).

The total monthly output of the two canning units is 7,000 cases of 48 7-oz. cans. Five percent is canned tuna flakes and 95 percent is solid pack (4 chunks of meat to a can). In addition, the firm prepares 70 pounds of tuna sausage a day for local consumption. There is also half a ton of fish meal made each day, and this is sold for chicken feed. The fish meal sells for 23 to 24 Malayan cents (7 to 8 U.S. cents) a pound; the company plans to increase production to one long ton a day. Finally, the company produces a small amount of tuna-liver oil which can be added to the fish meal to enrich it, or it can be used in the manufacture of margarine.

At present the company exports its canned tuna to West Germany, Denmark, Austria, Switzerland, Holland, the United Kingdom, and Canada. In 1962 the firm hopes to start exports to the United States. There still is no market for canned tuna in Malaya.

According to the Deputy Manager Director, the firm is losing money. The reasons for this are, he said, the present unit of production is too small in comparison with the overhead fixed costs. In addition, both canning units are in leased buildings. The rents are high and the firm also has to pay all the utility charges for the premises even though only part of such utilities are used by them. Again, each of the 6 Japanese technicians is paid M\$1,000 (US\$333) a month. Each is on a 2-year contract, which is renewable. It is hoped that most of these technicians can be replaced with trained Malaysians, but that will not be possible for a year or more.

The company plans to build its own cannery on the land adjoining the refrigeration unit and to increase production. The cannery and refrigeration unit will then occupy an area of 50,000 square feet. This would mean a considerable capital outlay, but it should also mean a substantial saving in overhead costs. (United States Consulate, Penang, December 22, 1961.)

Malaya (Contd.):



Fig. 1 - One of two canning plants leased by the joint Japanese-Malayan tuna fishing and cannery operation at Penang, Malaya. This is the one shared by another canned food company.



Fig. 2 - Japanese tuna fishing vessel Fuku Maru II that has returned from the Indian Ocean with a catch, alongside a pier in Penang.

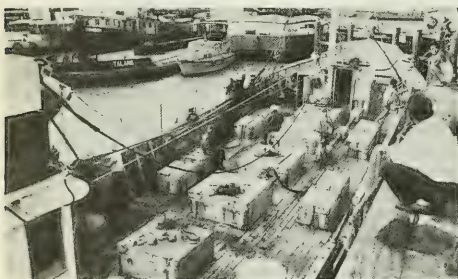


Fig. 3 - Japanese fishing vessel; looking toward the bow.



Fig. 4 - Tuna being taken out of the holds of Japanese fishing vessel.

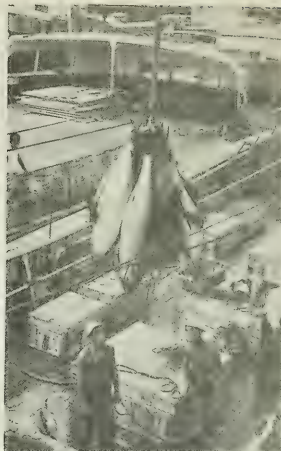


Fig. 5 - Unloading tuna at a pier in Penang.

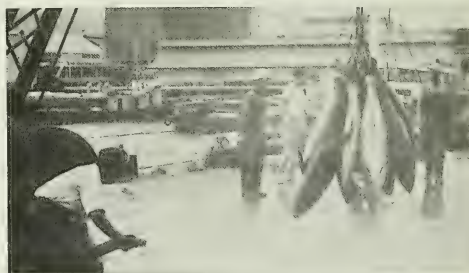


Fig. 6 - Tuna being hoisted on pier before weighing.

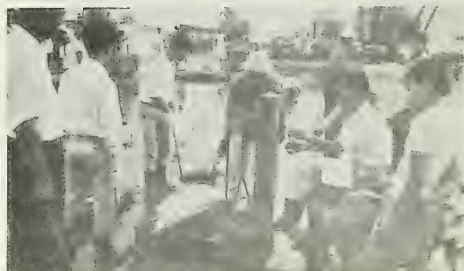


Fig. 7 - Tuna being weighed.

Malaya (Contd.):

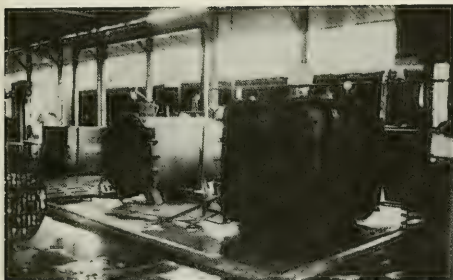


Fig. 8 - Steam ovens for cooking tuna at one of the canneries in Penang.



Fig. 11 - Tuna meat being sliced before canning.



Fig. 9 - Tuna cooling after removal from steam oven.



Fig. 12 - Packing tuna flakes into cans.



Fig. 13 - Cans are weighed before salt and oil is added to the tuna.



Fig. 10 - After cooling, the bones, dark meat, and skin are removed from the cooked tuna.



Fig. 14 - Adding salt to tuna.

Malaya (Contd.):



Fig. 15 - Sealer putting tops on cans. Japanese technician in the left supervises the work



Fig. 16 - Refrigeration unit for cold-storage plant.



Fig. 17 - Part of refrigeration machinery for cold-storage plant.

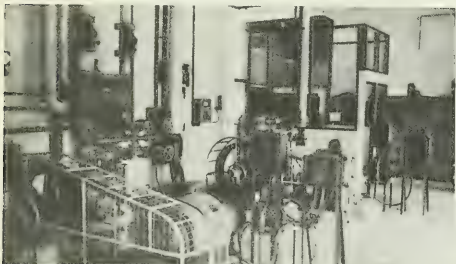


Fig. 18 - Inside control room of refrigeration room.

Mexico

SEVERANCE TAX CHANGED ON SOME SHRIMP PRODUCTS:

Mexican severance tax categories for beheaded cooked, dried peeled, and dried shrimp with shell on were eliminated in the same decree that increased the ad valorem duty on all imports of edible fresh, frozen, dried, or canned fishery products. The decree became effective January 1, 1962 (Diario Oficial, December 30, 1961).

This means that in the future shrimp falling in the categories mentioned above will pay severance taxes on the basis of fresh whole or fresh headless. In essence this means an increase in taxes on the beheaded cooked, dried peeled, and dried shrimp. However, only relatively small amounts of dried and cooked shrimp have been produced in Mexico in recent years. The bulk of the shrimp production in Mexico consists of fresh headless on which the severance tax is 22 centavos a kilogram (about 0.8 U. S. cents a pound). The severance tax on fresh whole or heads-on shrimp is 21 centavos a kilogram (about 0.76 cents a pound). (United States Embassy, Mexico City, January 18, 1962.)

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IMPORT DUTIES ON EDIBLE FISHERY PRODUCTS INCREASED:

An additional ten percent ad valorem duty has been placed by Mexico on all imports of edible fresh, frozen, dried, or canned fishery products. The funds derived from this tax, which is levied on many items other than fishery products, will be used to develop exports of locally-manufactured products. The higher rate of duty became effective January 1, 1962 (Diario Oficial, December 30, 1961).

It is not anticipated that this increase in duties will affect appreciably imports of fishery products from the United States since most of these are luxury items. Total Mexican imports of edible fishery products in 1960 were valued at about US\$1.4 million of which less than \$60,000 worth were from the United States.

The same decree also repealed the last paragraph of Article 5 of the Law of November 17, 1939, which provided for free sport-fishing permits in Baja California. Foreign non-residents of Mexico must now obtain li-

Mexico (Contd.):

censes for fishing in Baja California. The fees are nominal: 6 pesos (about 48 U. S. cents) for a three-day permit; 10 pesos (about 80 cents) for a one-month permit; 25 pesos (about US\$2) for a three-month permit; 50 pesos (about \$4) for a one-year permit. (United States Embassy, Mexico City, January 10, 1962.)



Nicaragua

SHRIMP FISHERY TRENDS:

The focal point of major shrimp fishing activities in Nicaragua shifted during the final quarter of 1961 from the East Coast to the Pacific Coast as a large United States firm operating out of Corinto put 30 vessels to fishing shrimp. These vessels were catching over 200,000 pounds of large shrimp each month as of January 1962. The United States firm is employing some 140 Nicaraguans and as of January had begun the installation of a freezing and packing plant.

Another Nicaraguan fishing company was organized during the quarter and will operate out of Puerto Somoza, also on the West Coast. Puerto Morazan (West Coast) fishermen again complained about Salvadoran fishing incursions.

Operations at Casacrus on the East Coast reportedly picked up in December 1961.

Total 1961 shrimp exports from Nicaragua totaled about 900,000 pounds valued at \$475,000. In 1960 shrimp exports totaled only 515,000 pounds. (United States Embassy, Managua, January 25, 1962.)



Norway

DISMAL PROSPECTS FOR WINTER HERRING FISHERY:

January reports from Aalesund, main fishing port in West Norway, indicate that predictions of another poor winter herring season are all too true. Aalesund, which in late January used to be teeming with fishermen, showed few signs of activity this year. Crews for herring vessels are in short supply. With prospects of a fair catch none too promising, many fishermen have switched to other types of work. Others have obtained jobs on fishing vessels which presently are landing sizable quantities of herring in the Lofoten waters of North Norway. This is a new develop-

ment, for Lofoten has traditionally been known mainly for its cod.

Just how many fishing vessels will be on hand for the long overdue start of the West Norway winter herring season is difficult to say. Local experts guess that no more than about 150 purse seiners will take part. Five years ago, there were 599 purse seiners, besides 1,408 drift netters and 489 auxiliary craft, manned by a total of nearly 30,000 fishermen. Last year, only 254 purse seiners and 789 drift netters showed up, while the number of auxiliary craft dropped to 147.

With further reductions expected this year, hardly more than some 10,000 men are likely to try their luck in the herring fishery off the coast of West Norway. Thus, over a period of five years, altogether some 450 purse seiners and 400 auxiliary craft, plus about 700 drift netters, manned by altogether 20,000 fishermen, have quit the once so profitable herring fishery.

In the same period, the first-hand or ex-vessel value of the herring catch has dropped catastrophically from Kr. 260 million (US\$36.5 million) to slightly over Kr. 18 million (\$2.5 million) last year. Operators and fishermen, at first staggered by the turn of events, have adjusted surprisingly well to the fact that for the present, at least, the abundant herring harvest is a thing of the past. The herring meal and oil processing industry, too, has managed to survive by and large.

Rather than wait for the western herring fishery to pick up, many operators have diverted their vessels to different waters. Quite a few have found profitable fishing grounds in the North Sea. Others are doing well off the Finnmark coast, where landings of herring and caplin have shown a notable increase in the past several years. As of January 1962, some 150 vessels were fishing for cod on the Halten Bank, some 50 nautical miles off North Trøndelag. Enterprising fishermen from the Sunnmøre district were making good catches off the Faroe Islands. Fishing for porbeagle in the North Atlantic has also proved rewarding for some.

Meanwhile, prospects for the West Norway winter herring fishery are the most dismal in many decades. A year ago, ocean researchers said that, granted reasonably fair weather, the total quantity might reach about 200,000 metric tons. However, fierce storms raged during the better part of the season, with the result that fishermen landed only slightly over 69,000 tons, as against more than 300,000 tons in 1960. On the eve of the 1962 season, researchers cautiously warn that the weather will have to be much better than last year to manage a catch of about 100,000 tons. The quantity of mature herring coming to spawn on the coastal banks this year is estimated to be 25 percent smaller than it was a year ago. Next year, however, the fairly plentiful crop of herring spawned in 1959 should help to increase the influx of mature fish. (*News of Norway*, January 25, 1962.)

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FISH FINDER HAS LIMITED USE IN TUNA FISHERY:

Norwegian research in the use of the fish finder ASDIC in tuna fishing began in the 1960 season. The purpose was to determine whether ASDIC could be used in the tuna fishery. The herring ASDIC was used. The preliminary results can be summarized as follows:

Schools of tuna give echoes, but it has not been possible to distinguish any special characteristics of the echo. It is difficult, there-

Norway (Contd.):

fore, to determine whether an echo derives from tuna or from other school fish, if one does not see the fish at the surface. The range of an echo from fish at the surface is about 2,300-2,600 feet. If the tuna break the surface, an observer can see them at a much greater distance. When the fish "striper" (fishermen's term which means tuna barely break surface), it can often be difficult to see them.

The value of ASDIC in the tuna fishery seems to be limited because echoes from other school fish, which naturally enough are abundant where tuna feed, dominate the echogram. The best fishing grounds for tuna off Western Norway (Vestlandet) in 1960/61 yielded a strong interfering bottom echo due to the uneven bottom conditions.

Because of these experiences, it was concluded that the value of ASDIC for expanding the tuna fishery seems to be greatly limited. Meanwhile it must be stressed that all parts of the problem have not been adequately investigated. Tests were not made continuously throughout the entire season, and were limited to the fishing grounds between Bulandet and Espevaer. The experiments will continue, therefore, in 1962, and it is hoped the fishing grounds in Northern Norway may be tested also. (Translated excerpt from the "Report of the Tuna Cruise of M/V Thor Iverson," August 2-September 7, 1960. Original article appeared in the January 25, 1962, Fiskets Gang, Norwegian periodical.)



Peru

FISH MEAL INDUSTRY TRENDS:

At the end of 1961, the official count of enterprises in the fisheries manufacturing industry (freezing, canning, salting, fish meal and fish oil) was 129 companies operating 269 processing plants (114 of them producing fish meal).

Fish meal production and exports continue to constitute the major activity of the industry. An estimate of Peru's fish meal production for 1961 of 640,000 metric tons, made in November by the Fisheries Service of the Ministry of Agriculture, was somewhat lower than the 680,000 to 700,000 tons estimated earlier by the industry.

Data have not yet been made available on fish meal exports for 1961. When released, they are likely to show a considerable increase over the 600,000-ton quota originally assigned to Peru by the international fish meal producers group.

As the new year opened, Peruvian producers were anticipating somewhat higher production than last year, but as of the end of January persistent early morning fogs had hampered anchoveta fishing. Also a week's strike of fishermen in Chimbote was expected to reduce January production. Also a short strike by truckers and a Government decree closing 33 plants in Chimbote on February 1 because of the odor problem further curtailed fish meal production. But information early in February indicated the labor disputes had been settled and plants were operating again. As of the first part of February fishing continued poor.

The situation apparently influenced the fish meal marketing organization (Consorcio Pesquera del Peru, S.A.) to announce that it temporarily would not accept new orders, since those on hand were expected to exhaust available supplies. The organization was to reassess the situation from time to time, in order to maintain a reasonable balance between total supplies and total sales. Meanwhile, world demand for fish meal is said to be rising and prices to be holding up well. (United States Embassy, Lima, report of January 30, 1962.)

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MOST FISH MEAL PLANTS REPORTED SHUT DOWN:

The Consorcio Pesquera del Peru S.A. (marketing organization for fish meal producers) announced the first part of February 1962 that about 80 percent of Peru's fish reduction capacity has been curtailed due to (1) a series of strikes by truck drivers since January 1, 1962, (2) renewed fishermen's tie-ups effective January 29, and (3) a Government decree closing 33 plants at Chimbote on February 1 because of odor problems.

These developments have affected February delivery schedules of fish meal contracts with United States buyers to the extent that the Consorcio has declared "Force Majeure" (circumstances beyond control of seller). A later report states that these developments will also affect March delivery schedules.

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Peru (Contd.):

FISH MEAL PLANTS OPERATING AGAIN:

Information received as of mid-February 1962 indicates that the labor disputes affecting truck drivers and fishermen in Peru have been settled. These labor disputes were affecting the production of fish meal. Also, the plants in Chimbote closed on February 1 by a Government decree because of odor problems are operating again, but fishing early in February was reported poor.



Philippines

GOVERNMENT'S ECONOMIC REFORM AFFECTS FISHERY PRODUCTS IMPORTS:

The Philippine Government announced that it would revise the dual exchange rate system by abolishing the official rate and establishing a single free rate of exchange, according to a translation from the Japanese periodical *Suisan Tsushin* of January 23, 1962. This means that decontrolled items, such as canned sardine and canned salmon heretofore imported into the Philippines under the official exchange rate, will hereafter be transacted under the free rate. So far as the effect on canned sardines is concerned, this measure virtually amounts to devaluing the currency and will inevitably push up the sardine market price. As a result, sales of canned sardines are expected to decrease. On the other hand, the Government's action will eliminate differences in exchange rate between canned sardines on the one hand and canned saury and canned jack mackerel on the other, which the Philippines have always imported under the free trade.

According to the *Suisan Tsushin* of January 26, the Japan Canned Foods Exporters Association received a detailed report regarding changes in the Philippine exchange rate. Gist of this report follows:

1. After January 22, all imports will be carried out under the free exchange rate (also referred to as the "floating rate").
2. The Philippine Government has provisionally discontinued levying the marginal tax and plans to formally abolish it in the future.
3. The Philippine Bank Association will establish the new free rate. Present outlook is that the exchange rate will fluctuate between 4 to 4.6 pesos for each US\$1.
4. Import tariff rates will be drastically revised. Tariffs will be reduced for essential goods and increased for nonessential goods. The current 15-percent tariff on canned sardines and canned corn beef will be lowered to 8 percent; tariffs on canned saury and canned jack mackerel will most likely remain at the present rate of 15 percent.
5. Bond rate for importers was reduced from the previous 50 percent to 25 percent for decontrolled items, such as canned sardines, canned saury and canned mackerel, but was increased to 150 percent for nonessential goods.

Views of the Japan Canned Foods Exporters Association concerning the above economic reform carried out by the Philippine Government are essentially as follows:

1. Import duty on canned sardines has been lowered to 8 percent. Should canned sardines be imported into the Philippines at the new exchange rate of over 4 pesos to a dollar, as

compared with the previous rate of 2.5 pesos to a dollar, the import price of that product would be about twice that of the former price. Sales of canned sardines will be slow until the new price gains consumer acceptance. At this time of the year, American fish canners are out of stock, but the confusion brought about in the Philippines by the currency reform virtually eliminates the opportunity of introducing Japanese products into the Philippines at this time.

The Philippine Government has issued new import licenses, but all earlier trade negotiations pending issuance of new licenses are expected to be cancelled.

2. Canned saury is no longer subject to the marginal tax and this has saved this product from becoming a completely hopeless trade item. However, the new tariff rate on canned sardines is 7 percent below that of canned saury, and canned sardines will now sell for about the same price as that for canned saury, although the import price of canned saury is presently 200 yen (55 U.S. cents) less per case than that for canned sardines. This does not make canned saury attractive to the Philippine buyers. Some hope could be held out for canned saury if the Philippine Government would reduce the tariff on that product to the same level as that for canned sardines. Even then, it would be extremely difficult for Japanese canned saury to compete piecewise with South African fishery products.



Portugal

CANNED FISH PACK, JANUARY-SEPTEMBER 1961:

Portugal's total pack of canned fish in oil or sauce for the first 9 months of 1961 was up 15.3 percent as compared to the same period in 1960. The sardine pack accounted for 70.2 percent of the total, followed by tuna (9.4 percent) and anchovy fillets (8.6 percent). There were substantial increases in 1961 in the packs of anchovy fillets, sardines (up 11.1 percent), and mackerel. There was a decrease of 12.6 percent in the pack of tuna.

Portuguese Canned Fish Pack, January-September 1961-1961				
Product	January-September			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	29,651	1,561	26,677	1,404
Chinchards	1,987	104	1,770	94
Mackerel	2,766	110	410	16
Tuna and tuna-like	3,957	140	4,525	162
Anchovy fillets	3,638	364	2,666	267
Others	211	11	545	29
Total	42,210	2,290	36,593	1,972

During the first 9 months of 1961 sardine landings in Portugal totaled 69,164 metric tons. The bulk of the sardines landed are used for canning. Of the other species used for canning, there were landings of 1,614 tons of tuna, 108 tons of bonito, 4,123 tons of mackerel, 7,344 tons of anchovies, and 30,038 tons of chinchard. (*Conservas de Peixe*, November 1961.)

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Portugal (Contd.):

**CANNED FISH EXPORTS,
JANUARY-SEPTEMBER 1961:**

Portugal's exports of canned fish during the first 9 months of 1961 were 16.6 percent more than in the same period of 1960. Sardines accounted for 81.0 percent of the 1961 exports, followed by anchovy fillets with 7.6 percent, and tuna with 5.4 percent. In 1961, exports were up 13 percent for sardines, 16 percent for tuna, and 29.1 percent for anchovy fillets as compared to 1960.

Portuguese Canned Fish Exports, January-September 1961				
Product	January-September			
	1961		1960	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	40,281	2,120	35,654	1,876
Chinchards	1,733	91	1,135	60
Mackerel	1,060	42	378	14
Tuna and tunalike	2,689	96	2,318	83
Anchovy fillets	3,770	377	2,920	291
Others	186	10	243	12
Total	49,719	2,736	42,648	2,336

Portugal's principal canned fish buyers during the first 9 months of 1961 were Germany with 11,097 metric tons, followed by the United States with 5,667 tons, United Kingdom with 5,345 tons, Italy 4,249 tons, France 3,379 tons, and Belgium-Luxembourg 3,097 tons. (*Conservas de Peixe*, November 1961.)

**Spain****TUNA FISHING INDUSTRY:**

The summer tuna fishing season in Spain ended in October 1961 with a catch some 10 to 15 percent below that of the previous year in quantity. But because of higher prices, the value was the same.

Between the end of the summer tuna season and the beginning of the anchovy season in March, local fishing largely is limited to sea bream ("besugo"), round pompano ("palometa"), and mackerel. During the fourth quarter of 1961 the catch of those species was very light, with round pompano practically nonexistent and with sea bream making its appearance only after the first week of December. Consequently, wholesale prices of those species rose about 20 percent over the previous year.

Given the now perennial scarcity of fish in local waters during the winter months, it has become customary for the larger fishing vessels of Vizcaya to go to the South Atlantic to fish tuna until the spring or summer. This winter 16 vessels (2 more than last year, but 3 less than the 1959-60 record) with 350 crew members entered into a contract with a large California tuna canning firm. The contract is for 3 months from the beginning of December 1961 and it may be renewed on mutual agreement for another 3 months. The

vessels were to make Freetown, Sierra Leone, their base until the end of December when they would transfer their operations to Abidjan Ivory Coast. Reports indicate that the catch by those vessels as of early January, 1962 has been good—some 933 metric tons of lower-grade tuna ("serrucho") during the 22 fishing days of December—and that facilities for receiving the catches on shore are better than last year.

Undoubtedly in imitation of the Vizcayan tradition, some 100 other vessels from various ports in the district have gone to Algeciras or other nearby Spanish ports to fish for "melva" (similar to tuna) in nearby Atlantic and Mediterranean waters. There have been reports of disappointment, and some of the vessels have returned.

There is considerable concern with the need to modernize the fishing fleet and to increase the cold-storage capacity of both the fleet and shore installations. Reports of plans to build long-range tuna vessels with cold-storage facilities have been circulating, but realization of such plans seem to be awaiting a more generous flow of ship construction credits which may occur in early 1962. (United States Consulate, Bilbao, January 8, 1962.)

**Sweden****HERRING BONING MACHINE:**

A British firm in 1961 received a Swedish-built machine for the beheading, tailing, and filleting of herring. Fish from 6½ to 13 inches (17 to 33 cm.) in length can be handled. Only one operator is required, who should be able to put through about 60 herring per minute.

The machine is provided with a feed table on which there is a single enclosed knife. The fish is held against the knife to remove the tail, and is then pushed forward to be caught by one of 4 rotating arms which push the fish on to a circular knife, removing the head. The herring then follows a groove down the feed table to be caught between 2 rubber belts, which convey the fish under 2 horizontal knives. The belly is cut, and then the fish is gutted by a rotating pulley. Rotating knives further remove the back and side-bones leaving 2 connected fillets. The machine may be adjusted to leave single fillets. Constant flushing removes all residue, and once the operator has held the fish against the first knife for trimming the tail, his hands are free to deal with the next fish. (*Food Processing and Packaging*, vol. 30, no. 62 (1961), p. 353.)



Taiwan

FISHERY LANDINGS CONTINUED TO INCREASE IN 1961:

Taiwan's fishery landings in 1961 reached 312,439 metric tons as compared to 259,140 tons in 1960. They exceeded the 1961 target of 270,000 metric tons by over 42,000 metric tons. The large increase was the result



Auctioning of tuna in the Kaohsiung Fish Market, Taiwan.

of (1) unusually good catches of sardines and moonfish, (2) an increase in the number and tonnage of fishing vessels, and (3) fair fishing weather.

Taiwan's Fishery Landings, 1957-61					
Type of Fishery	1961	1960	1959	1958	1957
	(Metric Tons)				
Deep-sea . . .	106,147	85,210	76,411	61,160	52,223
Inshore . . .	117,405	94,856	91,240	81,720	71,552
Coastal . . .	31,533	30,044	32,183	38,267	38,468
Fish culture .	57,354	49,030	46,493	48,530	45,878
Total . . .	312,439	259,140	246,327	229,677	208,121

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NIGHT FISHING WITH PURSE SEINES SUCCESSFUL AT SUAO:

From the important inshore fishing port of Suao, fishermen tried night fishing with purse seines. Using fish finders to locate the fish and mercury lamps to bring the fish schools to the surface, both supplied by the Joint Commission on Rural Reconstruction (JCRR), one pair of purse seiners caught 30 tons of moonfish in one night. Other fishermen followed suit with the result that the catch of moonfish in 1961 was the biggest ever made in Taiwan.

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LOAN FOR CONSTRUCTION OF TUNA LONG-LINERS:

The JCRR extended a loan for the construction of 12 145-ton long-liners in 1961. The boats as of February 1962 were under construction in shipyards in Taiwan and were expected to be available for use early in 1962. They will operate from the port of Kaohsiung and are expected to add about 5,000 metric tons of tuna to the Island's fish catch. Taiwan's 1961 export of frozen tuna amounted to 1,116 metric tons valued at US\$347,679.

All articles under Taiwan are by

--T. P. Chen, Chief, Fisheries Division, Joint Commission on Rural Reconstruction, Taipei, Taiwan.

Note: See Commercial Fisheries Review, April 1962 p. 85.



U.S.S.R.

FISHERY CATCH SETS NEW RECORD IN 1961:

The Soviet Union's 1961 catch of 3.7 million metric tons exceeded the record 1960 catch of almost 3.1 million tons.



Fig. 1 - Russian fishery factorship operating in Bering Sea. Home Port, Bladnoctok.

It was admitted, however, that this catch "still far from satisfied the population's present demand" for fish, and that the composition of the catch leaves much to be desired. The gross catch figure includes "a certain quantity" of nonfood species as well as an oversupply of "hors d'oeuvre" species--sprat, sardelle, khamsa (anchovy, *Engraulis encrasicolus*), etc., which have only a limited demand. On the other hand, the catch of fresh

U. S. S. R. (Contd.):



Fig. 2 - Two Russian fishing trawlers operating in Bering Sea. Approximate length 70 feet.

water species, which have a "basic demand" (i.e., pike, sazan or wild carp, carp, bream, sheatfish, etc.), and "by the availability of which the population judges the works of the fish industry," has decreased somewhat in recent years. (Translation from Rybovodstvo i Rybolovstvo, No. 1, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 94.



United Kingdom

EXPORT COMBINE FORMED BY TEN LEADING FISH PROCESSORS:

Ten leading British fish-processing and quick-freezing firms, all headquartered in the Hull-Grimsby area, have combined in a drive for the export of frozen fish in "catering" packs, according to a January 2, 1962, announcement. The combine has taken over the name of a firm formed four years ago when two firms joined forces to sell frozen fish to Eastern Europe. Substantial exports of frozen fish to Iron Curtain countries have been made under the British label in the last four years from the fishing ports of Hull, Grimsby, and Fleetwood, Lancashire.

The registered office of the new export combine firm is at Grimsby, Lincolnshire, and each of the ten firms has a representative on the main board of the company. In addition, day-to-day administration is carried out by a committee of four.

The Chairman of the new combine states that the organization has been set up to counter "the nationally organized fishing industries of other countries."

The company works closely with the British Trawlers Federation, which is attempting to develop a world market for British fish. Bulk purchasing of all raw materials, streamlining of administration, and centralization of sales effort will, it is anticipated, stabilize marketing. Stringent quality control specifications for products have been laid down and plants of member firms will be inspected regularly to see that these standards are being observed.

In the first year, the organization anticipates total shipments of frozen fish to be about 10 million pounds, worth

about £750,000 (US\$2,100,000). The principal markets aimed at will be Eastern Europe (all types of fish) and Australia (sea bream). The home market for sea bream has been disappointing, but small-scale exports from Hull to Australia during the summer of 1961 have given members of the trade an opportunity for testing the overseas market. A Hull spokesman said "There are very substantial sales of bream in Australia and we are hoping to develop them." (United States Consulate, Manchester, England, January 4, 1962.)

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UNDERWATER REMOTE CONTROL CAMERA DEVELOPED TO STUDY FISH BEHAVIOR:

A simple self-contained camera and flash unit, using dry batteries and operated by a clockwork timer, which can take about 200 exposures at preset intervals (actually 1-minute and 3-minute intervals have been used) has been developed by the Scottish Home Department Marine Laboratory at Torry, Aberdeen.

The camera has been used in two ways: (a) Attached near the headline of a trawl, so as to photograph the groundrope, or the zone immediately in front of it. The first sets of results, in depths up to 65 fathoms, confirm frogmen observations that fish in that region are normally swimming away from the groundrope and are therefore aware of the fishing gear. These observations will be continued to determine more exactly the influence of depth and light. (b) Placed on a heavy tripod and left on the sea-bed for subsequent recovery by means of a buoy rope. When used in this way there is less chance of fish being disturbed from their normal behavior than when the camera is swinging below a vessel. A first set of experiments was made using this technique in March 1960 on Ballantrae

United Kingdom (Contd.):

Bank, in the Firth of Clyde. This technique showed that most of the fish then present near the bottom were herring, that their numbers and schooling pattern on that occasion did not vary with the time of day or night, and that the fish were present in small schools of 12 to 20 fish. A local population density of about 2,000,000 fish/sq. mile was estimated from the known lens angle and limits of visibility. (*Nature*, vol. 188 (1960) p. 333.)

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INFORMATION ON LONDON TRADE CENTER AND BRITISH FOOD FAIRS FOR EXHIBITING U. S. FISHERY PRODUCTS:

The United States Trade Center in London has good facilities for a commodity exhibit. It is located in the neighborhood of Piccadilly Circus at 57 St. James Street, London, S.W.1.

The next food exhibition is for fruit in late October or early November 1962. Since fruit may not need the full month allotted, it might be possible for fish to utilize the latter part of the allocated time. The next general exhibition for food is planned for about March 1963, unless the fruit plans fall through, in which case the general food exhibition might be moved up in its place. Fish, of course, could participate in the general food exhibition.

Exhibitions at the U. S. Trade Center provide excellent publicity, a presentation of products to buyers, and an opportunity to make sales. At the American Food Exhibition at the Center, September 6-22, 1961, about 2,000 trade representatives attended. A sample check of exhibitors indicated all would participate again. Freeze-dried shrimp, as a new and unique United States product, was the hit of the show. Exhibitors of this product found participation in the food exhibition very helpful in introducing their product to a great number of trade people quickly and at little cost.

The U. S. Trade Center offers no special facilities for showing films but they could be shown at luncheons. Ties between fish and agricultural products might be arranged, for example, fish and rice. Exhibition at the Trade Center would reach representatives interested in both the home consumption market and the large catering or institutional trade. When their imports are on display, London trade circles usually cooperate by having local sales representatives at the exhibits.

From May 8 to 20, 1962, there will be the 30th annual Grocery Fair at Manchester. It will have food exhibits from the United States for the first time. Six other countries also will be represented. The location is in the Midlands, not far from the import center of Liverpool, and in a large industrial food consuming area. Grocery Manufacturers of America are to handle the United States food exhibits in a self-service food store where foods can be purchased. Fish could be exhibited.

The British Food Fair in London will run from August 22 to September 12, 1962. It is larger than the Manchester fair. Grocery Manufacturers of America plan to use the same exhibit as at Manchester with appropriate changes. In general these fairs will offer (1) an opportunity to display products, and to sell them in a self-service market in the case of the GMA exhibit, (2) a demonstration area for commodity groups—e.g., canned fish—where there can be sampling, demonstration of recipes, etc., and (3) a trade lounge where contacts can be made with buyers and trading conducted.

If participation were considered for either of the latter two fairs, the pattern of other successful efforts might be followed. This would include having a United States home economist available to supervise demonstrations, and a per-

son familiar with United States processing and the products. A person familiar with fish products is required to handle the exhibit and those inquiries relating to products for which there are no British representatives, for example, for those United States packers seeking entry to the market and local representatives.

Eight representatives of London fish trade circles were interviewed. Represented were importers of United States or other foreign products, importers of United States products sold under the United States label, and distributors of fish products in multiple stores. In general the interviews revealed:

The great proportion of canned fishery products consumed in the United Kingdom, especially salmon, is sold under 5 or 6 national brands. The owners of the brands may use fish from any one of several sources under one brand name. For example, a dominant salmon brand may contain salmon from the United States, Canada, or Japan. Thus, exhibiting in such a manner as to promote the United States salmon used in such a brand is difficult or impossible. The source of the salmon is not readily obvious to the consumer since the actual country source is not designated as such but in general terms such as "empire packed" for Canada and "foreign packed" for the United States. So it does not help to ask the consumer or buyer to look for a U. S. source on the label.

Nor is it effective to push the national label itself because such promotion would also aid the Canadian and Japanese products used under the same label. In fact, since those products supply a greater share of the market they would be aided to a greater degree. Those interviewed were unanimous in agreeing that exhibiting at trade fairs by packers of United States salmon which were distributed under the dominant national brands would be an ineffective procedure. It is less true for other United States canned fish products, some of which are distributed under United States brands.

All agreed that if U. S. fish were sold in Britain under a U. S. label, exhibiting the product at food fairs was a type of promotion which would be helpful. However, they pointed out that substantial advertising in various media, competitive quality and prices, and local stocks were more important in promoting sales.

All agreed, also, that if a U. S. product seeking to enter the British market, would be backed by advertising, be competitive in price and quality, and adequately stocked, exhibiting at a food fair would be helpful.

All agreed, further, that a U. S. product that was so unique or individual that it would maintain the U. S. identity, even though under a national label, would benefit from exhibition at a food fair. An example of such a product might be one produced by a U.S.-controlled process—freeze-dried shrimp, for example—or one for which the dominant or only source was the U. S.

There was fairly general agreement that the best way to promote U. S. canned fish in Britain under a U. S. label was to choose one of the half dozen or so large importers or buyers, who had good connections with the multiple store groups, as a British representative. Very substantial funds would have to be expended on advertising in all forms. Quality and prices would have to meet those of other sources. And substantial local stocks would have to be available. All emphasized this was a very costly process.

Salmon, shrimp, and crab seem to offer the best possibilities for exhibition. The current demand for each is good. Importers said there seemed to be little demand for canned oysters or clams and that an extensive publicity campaign probably would be needed to expand the market. The pilchard market is dominated by South Africa. Tuna moves very slowly. Most said the consuming public was slow to change and just did not seem to have much taste for tuna. U. S. salmon must compete with Japan, Canada, and Russia. Shrimp competes primarily with Norway, and crab with Russia and Japan.

At present, there is a good demand for salmon, shrimp, and crab of competitive quality and at competitive prices.

United Kingdom (Contd.):

The potential is materially affected by price and quality. There were several adverse comments on the quality of U. S. products. (Based on a report of a survey made in January 1962 by the Regional Fisheries Attache, United States Embassy, Copenhagen.)

* * * * *

FISHERY LOANS INTEREST
RATES REVISED:

The British White Fish Authority announced that as a result of changes in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from December 28, 1961, are:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not

more than 5 years, $6\frac{1}{2}$ percent (increase $\frac{1}{8}$ percent); for more than 5 years but not more than 10 years, $6\frac{3}{8}$ percent (increase $\frac{1}{8}$ percent); for more than 10 years but not more than 15 years, $6\frac{5}{8}$ percent (increase $\frac{1}{4}$ percent); for more than 15 years but not more than 20 years, 7 percent (increase $\frac{1}{4}$ percent).

Processing plants: on loans for not more than 15 years, $7\frac{1}{2}$ percent (no change); for more than 15 years but not more than 20 years, $7\frac{1}{2}$ percent (no change).

The rates on loans made before December 28, 1961, are unchanged. (Fish Trades Gazette, January 6, 1962.)

Note: See Commercial Fisheries Review, January 1962 p. 64.



JAPANESE CROSSBREED SALMON AND TROUT

A new variety of fish has been developed by crossbreeding ocean salmon and fresh-water trout. The new breed was produced by a group of scientists in the Hokkaido Fishery Incubation Station, Japan.

The creation of the new breed is significant in two ways. First of all, the newly-developed fish promises to be a species which will taste just as good as the ocean salmon the Japanese are so fond of. But more important, it can be spawned and raised in fresh water.

Salmon migrate during the spawning season to fresh-water streams in the Soviet Union, the United States, Canada, and Japan. When the young fish are hatched, they descend the streams and swim toward the sea. Since they were spawned in the rivers of various countries, it is hard to determine the various countries' respective fishing rights.

The new variety was developed by crossbreeding male ocean salmon with a fresh-water trout popularly known as the "sockeye" or blueback trout. Scientists at the incubation station obtained 3,500 fish eggs from the fresh-water trout and put them into an experimental tank. Ocean trout were then released in the tank to fertilize the eggs. When the incubation period was over and young fish began to emerge, the scientists found that 50 percent of the eggs had been successfully incubated.

The crossbreeding proved to be a success and the newly-hatched fish can live in fresh water. When fully developed, the fish are expected to grow larger than trout, which normally attain a length of about 38 cm. (15 inches). A great number of "sockeye" trout is now being raised in the fresh water tanks that abound in Japan. Trout will eventually be used to provide the eggs for the development of the new salmon-trout breed of fish.

The development of a new variety of fish which can thrive in fresh water may be called a sort of ichthyological breakthrough. By developing the new breed of fish, a way has been opened toward the hatching of salmon-type fish in landlocked waters. (Japanese Information Office, Bangkok, July 1, 1960, and IPFC Current Affairs Bulletin, December 1960.)



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

INDUSTRIAL LOAN TO FLORIDA CANNING FIRM APPROVED:

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce has approved a \$652,135 industrial loan to a Florida fish canning firm. The loan will help provide more than 350 permanent new jobs in Apalachicola, Fla.

The loan, repayable over a 25-year period and bearing an annual interest rate of 4 percent, will be made to the Florida Seafood Canning Company, Inc. of Apalachicola. In addition to the money which is being borrowed from the Federal Government, a State group, the Industrial Development Corporation of Florida, will contribute \$100,328 and the Florida Seafood Canning Company has raised \$250,822.

The Department of the Interior investigated the feasibility of the Apalachicola Project, and the Small Business Administration negotiated the loan for ARA with the concurrence of the Community Facilities Administration. The project was also approved by the Florida Development Commission, the agency designated by Governor Farris Bryant to represent the State in redevelopment matters. This is in accordance with action taken by the Secretary of Commerce in delegating responsibility for key phases of the area redevelopment program to Federal and state agencies and departments in order to take advantage of existing Government facilities and to prevent duplication of effort.

The project will make possible the construction of a new fish processing plant, marine ways, machine shop, and the installation of machinery and equipment. The company will be processing seafood such as oysters, crab, scallops, shrimp, edible fish, and fish for animal diets.

Simultaneously with the loan for the construction of the processing plant, ARA is also making a public facility loan of \$28,000 to the City of Apalachicola, repayable from revenue, to extend water and sewer facilities to serve the canning company.

Apalachicola is located in Franklin County, Fla., which was designated a redevelopment area eligible for participation in the area redevelopment program because of its substantial and persistent unemployment. The Apalachicola project came into being because of action on the part of the Apalachicola community to create local industry and new job opportunities by broadening the area's economic base. The 350 new jobs which will result from the ARA-assisted enterprise represent only the direct new employment at the Apalachicola processing plant. In addition, permanent employment will be created because of the firm's increased need for local services; other jobs will result in the service trades because of increased local purchasing power; and temporary employment will also be increased during the period of the construction of the plant.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

STANDARD OF IDENTITY FOR FISH FLOUR APPROVED:

A standard of identity for fish flour or fish protein supplement was approved on January 24, 1962, by the U. S. Food and Drug Administration. The standard requires that fish flour be made from cleaned fish after discarding the heads, tails, fins, viscera, and intestinal contents. The notice of approval appeared in the January 25, 1962, Federal Register. The order becomes effective on April 25, 1962.

The Commissioner of the Agency issued the following statement concerning the action:

"The Food and Drug Administration has completed study of almost 2,000 comments received on a previously published proposal to establish a standard of identity and thus legalize the marketing in the United States of a 'whole fish flour' made by grinding and drying entire fish of various sizes and varieties. During informal discussions before the proposal was submitted, we had expressed the opinion that such a product would be classed as filthy and thus illegal under the terms of the Federal Food, Drug, and Cosmetic Act because of the inclusion of the heads, tails, fins, viscera and intestinal contents. Proponents of the product, however, had maintained that we were not properly interpreting consumer understanding of the term 'filth.' For this reason the proposal for a standard was published, inviting all to express their views in the public record.

"Of the several hundred individual consumers and groups representing consumer interests who wrote, most opposed the adop-

tion of the proposed standard because the article was to be made from fish which had not been cleaned to remove those portions not customarily regarded in the United States as suitable for human food. Members of the food industries objected to the proposal on the grounds that legalization of such a product would adversely affect public confidence in commercially prepared food products now being made from clean, sound, wholesome ingredients under sanitary conditions. Many State and local food control agencies expressed the view that the product as described in the proposal would be classed as in violation of State and local laws.

"The proposal was strongly supported by firms and individuals connected with the fishing industry, many of whom frankly stated that authorization for this product as human food in the United States would be of great economic benefit to that industry and its employees. Others who favored the proposal pointed out that the product would be an excellent source of protein available at a low price for shipment to the underdeveloped countries of the world.

"Under the present terms of the Food, Drug, and Cosmetic Act it is entirely legal to prepare such a whole fish flour in the United States for export to any country in the world the laws of which do not prohibit that product. It is not unusual to encounter situations where a food entirely acceptable to the people of one country is not authorized for sale in others. This works both ways, in that certain countries prohibit the marketing of certain foods which are readily available and legal in the United States.

"While some have suggested that the 'whole fish flour' be so labeled that American consumers could choose or reject it, as they desire, this would not resolve the problem, since whole fish flour would not be eaten 'as is.' It would be used in preparing foods in factories, restaurants, and the like.

"As a result of consideration of all the available facts and opinions, the Food and Drug Administration is publishing an order which establishes a standard for 'fish flour' but requires that this be made from the cleaned fish after discarding the heads, tails, fins, viscera and intestinal contents. A product meeting this standard would be legal for shipment within the United States.

"Anyone adversely affected by the order has 30 days in which to file objections, with reasonable grounds, calling for a public hearing. If such a hearing is held, its results and the record of testimony taken will be subject to review by the United States Circuit Court of Appeals."

The order as published in the Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 37—FISH; DEFINITIONS AND STANDARDS OF IDENTITY; STANDARDS OF FILL OF CONTAINER

Fish Flour; Identity

In the FEDERAL REGISTER of September 15, 1961 (26 F.R. 8641), there was published a proposal for a standard of identity for fish protein concentrate, whole fish flour as submitted by Mr. Harold Putnam of Washington, D.C.

During the 60-day period thereafter, the Hearing Clerk of the Department of Health, Education, and Welfare received over 1,800 comments on the published proposal. Of the several hundred received from individual consumers who were opposed to the proposal as published, many specifically stated that they would class the article as filthy because of the use of the entire fish. In addition to comments from consumers and groups representing consumer interests, views were received from many connected with various food industries. A great many communications came from firms and individuals identified as being associated with the fishery industry and, with few exceptions, these favored the adoption of the standard as proposed. The view was repeatedly expressed that the adoption of the standard would be economically helpful to the fishing industry. Many of the comments favoring the proposal did so on the basis of the view that the nutritive value of the article described was such that it should be made available to those individuals in other countries suffering from a deficiency of protein in their diets. Only a few letters suggested or implied that the diet of the American public, generally, is deficient in protein or needs supplementation with a whole fish flour.

Officials charged with the enforcement of 21 State food laws opposed the proposed standard on the grounds that such a product would be in conflict with the laws of the States because of the inclusion of filth; some also stated that, in their view, such a product should be classed as adulterated under the Federal Food, Drug, and Cosmetic Act.

Bakery groups, a number of individual bakers, and some other food manufacturers opposed the proposal as published on several grounds. They referred to the high standards of cleanliness in their industries, their use of clean, sound, wholesome ingredients and expressed the

view that any official authorization of a whole fish flour, which they regarded as filthy, would have an adverse effect on public confidence in commercially prepared foods, and would significantly defeat effective law enforcement, local, State and Federal, in preventing the marketing of filthy foods and foods prepared under insanitary conditions.

Comments received came from more than half of the 50 States. In addition to firms in the United States indicating interest in manufacturing such a product, one comment was received from a producer of whole fish flour in Sweden stating that the firm has marketed most of its output principally for inclusion in a Swedish type of enriched bread. That firm contemplated that if the standard is adopted, it would be interested in marketing the product in the United States.

A few comments, including the one from the Swedish manufacturer, suggested some changes in the specifications of the proposed standard. These dealt with proposals to increase the moisture content, increase or decrease the protein content, increase or decrease the permitted ash content, and increase the bacteria limit. However, these comments furnished insufficient data to demonstrate that the changes advocated would promote the interests of consumers.

In view of section 402(a) (3) of the Federal Food, Drug, and Cosmetic Act, which states "A food shall be deemed to be adulterated if . . . it consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food," the Commissioner was particularly interested in learning the views of those who commented on the question of whether they would be willing to eat foods containing a whole fish flour so manufactured.

Seven hundred and thirty-six of the comments clearly opposed establishment of the proposed standard. One hundred and sixty-six of these specifically referred to their objection to the inclusion of viscera, heads, intestinal contents, etc., on the basis that they would regard the finished product as filthy. Of the 1,036 comments in favor of the standard as proposed, including the many duplicates signed by different individuals, only 17 specifically stated or strongly implied that they would be willing to eat such a product.

Therefore, on the basis of the information before him, the Commissioner finds:

1. That consumers in the United States generally would regard the product described in the proposal as filthy. Thus, such a product would be in conflict with section 402(a) (3) of the Federal Food, Drug, and Cosmetic Act.

2. That it would not promote honesty and fair dealing in the interest of consumers to establish a standard of identity for a whole fish flour containing those portions of the fish which would be

regarded as filthy by American consumers generally.

3. That it is apparent from the information available that many persons who advocate the establishment of the proposed standard are concerned with the reported need for a source of good protein by people in underdeveloped countries of the world where local food supplies and raw materials are inadequate to supply that need. To the extent that such a need for a product as described in the proposal exists in countries other than the United States, section 801(d) of the Federal Food, Drug, and Cosmetic Act provides for the manufacture of such a product in the United States for export to any other country of the world, the laws of which do not prohibit that article.

4. That even though there is no evidence that there is a deficiency of protein in the diet of the people of the United States, a factor which would have no bearing on whether or not certain parts of fish in a ground product constitute filth, there appears to be a reasonable basis for establishing a standard of identity for fish flour prepared from properly cleaned and eviscerated fish.

Accordingly, it is concluded that it will promote honesty and fair dealing in the interests of consumers to establish a definition and standard of identity for fish flour, as hereinafter set forth. Therefore, pursuant to the authority vested in the Secretary of Health, Education and Welfare by the Federal Food, Drug, and Cosmetic Act (secs. 401, 701, 52 Stat. 1046, 1055, as amended 70 Stat. 919; 21 U.S.C. 341, 371) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625); *it is ordered*, That the following definition and standard of identity be established:

§ 37.5 Fish flour; identity.

(a) Fish flour is the finely ground, dried product made from edible species of fish. From the time of catching until the finished article is packaged the fish are handled expeditiously and with the sanitary precautions which are recognized as proper for fish which are used in other forms for human food. Before processing, the fish are properly prepared to remove and discard the heads, fins, tails, viscera, and intestinal contents. The cleaned fish are ground and treated to reduce the fat content of the finished fish flour to less than 1 percent. The product may be deodorized. The finished fish flour shall meet all of the requirements set out in paragraph (b) of this section.

(b) (1) *Protein content.* Protein content ($N \times 6.25$), measured by methods of the Association of Official Agricultural Chemists, shall not be less than 70 percent by weight of the final product (Official Methods of Analysis, A.O.A.C., 9th Ed. sec. 22.011; ch. 22, p. 285). Biological values of the finished fish

flour shall not be less than 105 percent as measured by the official A.O.A.C. method for the biological evaluation of protein quality (secs. 39.133-39.137, inclusive, ch. 39, p. 680).

(2) *Moisture, ash and fat content.* Moisture, ash and fat content shall not exceed 6 percent, 25 percent and 1 percent respectively, by weight of the final product, measured by A.O.A.C. methods (secs. 22.003, 22.010, ch. 22, p. 283, 284; sec. 18.011-18.012, inclusive, ch. 18, p. 235).

(3) *Odor and taste.* The final product shall have no more than a faint fish odor and taste.

(4) *Storage stability.* Fish flour, after 6 months' storage at temperatures prevailing in areas of intended use (but not exceeding 38° C.) and when packed in metal containers or in polyethylene bags, shall show no spoilage as judged by the development of off-flavors, mold growth, production of toxic amines (histamine, tyramine), or by deterioration in protein quality.

(5) *Bacteria.* The product shall be free of *Escherichia coli*, *Salmonella*, and pathogenic anaerobes, and the total bacterial plate count shall not exceed 2,000 per gram.

(6) *Safety.* The finished product shall contain no food additive unless specifically authorized by regulation issued pursuant to section 409 of the Federal Food, Drug, and Cosmetic Act.

Any person who will be adversely affected by the foregoing order may at any time prior to the thirtieth day from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objection thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing, and such objections must be supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

Effective date. This order shall become effective 90 days from the date of its publication in the FEDERAL REGISTER, except as to any provisions that may be stayed by the filing of proper objections. Notice of the filing of objections or lack thereof will be announced by publication in the FEDERAL REGISTER.

(Secs. 401, 701, 52 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371)

Dated: January 22, 1962.

Geo. F. LARRICK,
Commissioner of Food and Drugs.

Note: See *Commercial Fisheries Review*, Nov. 1961 p. 70.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

INTERPRETIVE BULLETIN ISSUED ON MINIMUM WAGE AND OVERTIME FOR FISHING AND FISHERY PROCESSING:

An interpretative bulletin was issued on February 10, 1962, on the provisions of the Fair Labor Standards Act applicable to fishing and operations on or processing of aquatic products.

The bulletin gives the official position of the Department of Labor with respect to the provisions of the Act which govern rights and obligations of employees and employers in the various enterprises engaged in fishing and related activities and in operations on or processing of aquatic products.

It points out that amendments to sections 13(a)(5) and 13(b)(4) of the Act removed a minimum wage exemption, but retained an overtime exemption, for employees engaged in the processing (other than canning), marketing, freezing, curing, storing, packing for

shipment, or distributing of fish, shellfish, or other aquatic forms of animal or vegetable life and their byproducts. (Canning operations prior to enactment of the amendment were already subject to the minimum wage, but had an overtime exemption.) As a result, the minimum wage for those workers engaged in the processing (other than canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fishery products or byproducts became \$1.00 an hour on September 3, 1961. The amendments also extended the minimum wage and overtime exemption to employees engaged in canning and processing of marine products at sea.

The new bulletin is intended to make available in one place the official interpretations of such provisions by which the Department will be guided in carrying out its responsibilities under the Act. It discusses in some detail those exemption provisions of the Act in sections 13(a)(5) and 13(b)(4).

The complete text of the bulletin as published in the February 10 Federal Register follows:

Title 29—LABOR

Chapter V—Wage and Hour Division, Department of Labor

SUBCHAPTER B—STATEMENTS OF GENERAL POLICY OR INTERPRETATION NOT DIRECTLY RELATED TO REGULATIONS

PART 784—PROVISIONS OF THE FAIR LABOR STANDARDS ACT APPLICABLE TO FISHING AND OPERATIONS ON AQUATIC PRODUCTS

Revision

Part 784 of Chapter V, Title 29 of the Federal Regulations, is hereby revised in the manner indicated below in order to adapt it to the Fair Labor Standards Amendments of 1961 (Pub. Law 87-30).

As this revision is concerned solely with interpretative rules, neither public procedure nor delay in the effective date is required by section 4 of the Administrative Procedure Act, and it will become effective upon publication in the FEDERAL REGISTER.

As revised, 29 CFR Part 784 reads as follows:

Subpart A—General

INTRODUCTION

- Sec. 784.0 Purpose.
- 784.1 General scope of the Act.
- 784.2 Matters discussed in this part.
- 784.3 Matters discussed in other interpretations.
- 784.4 Significance of official interpretations.
- 784.5 Basic support for interpretations.
- 784.6 Interpretations made, continued, and superseded by this part.

SOME BASIC DEFINITIONS

- 784.7 Definition of terms used in the Act.

- 784.8 "Employer", "employee", and "employment".
- 784.9 "Person".
- 784.10 "Enterprise".
- 784.11 "Establishment".
- 784.12 "Enterprise engaged in commerce or in the production of goods for commerce".
- 784.13 "Commerce".
- 784.14 "Production".
- 784.15 "Goods".
- 784.16 "State".
- 784.17 "Regular rate".

APPLICATION OF COVERAGE AND EXEMPTION PROVISIONS OF THE ACT

- 784.18 Basic coverage in general.
- 784.19 Commerce activities of employees.
- 784.20 Commerce activities of enterprise in which employee is employed.
- 784.21 Exemption from the Act's provisions.
- 784.22 Guiding principles for applying coverage and exemption provisions.
- 784.23 Minimum wages and overtime pay for "old" and "new" coverage.
- 784.24 Pay standards for employees subject to "old" coverage of the Act.
- 784.25 Pay standards for "newly covered" employees.

Subpart B—Exemption Provisions Relating to Fishing and Aquatic Products

THE STATUTORY PROVISIONS

- 784.100 The section 13(a)(5) exemption.
- 784.101 The section 13(b)(4) exemption.

LEGISLATIVE HISTORY OF EXEMPTIONS

- 784.102 General legislative history.
- 784.103 Adoption of the exemption in the original 1938 Act.
- 784.104 The 1949 amendments.
- 784.105 The 1961 amendments.

PRINCIPLES APPLICABLE TO THE TWO EXEMPTIONS

- 784.106 Relationship of employee's work to named operations.
- 784.107 Relationship of employee's work to operations on the specified aquatic products.

- 784.108 Operations not included in named operations on forms of aquatic "life".
- 784.109 Manufacture of supplies for named operations is not exempt.
- 784.110 Performing operations both on non-aquatic products and named aquatic products.
- 784.111 Operations on named products with substantial amounts of other ingredients are not exempt.
- 784.112 Substantial amounts of nonaquatic products; enforcement policy.
- 784.113 Work related to named operations performed in off- or dead-season.
- 784.114 Application of exemptions on a workweek basis.
- 784.115 Exempt and noncovered work performed during the workweek.
- 784.116 Exempt and nonexempt work in the same workweek.
- 784.117 Combinations of exempt work.
- 784.118 Work subject to different minimum wage rates in same workweek.

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(a)(5) EXEMPTION

- Sec. 784.119 The exemption is intended for work affected by natural factors.
- 784.120 Effect of natural factors on named operations.
- 784.121 Application of exemption to "off-shore" activities in general.
- 784.122 Exempt fisheries operations.
- 784.123 Operations performed as an integrated part of fishing.
- 784.124 Operations performed on fishing equipment.
- 784.125 Going to and returning from work.
- 784.126 Loading and unloading.
- 784.127 Operation of the fishing vessel.
- 784.128 Office and clerical employees under section 13(a)(5).

FIRST PROCESSING, CANNING, OR PACKING OF MARINE PRODUCTS UNDER SECTION 13(a)(5)

- 784.129 Requirements for exemption of first processing, etc. at sea.
- 784.130 "Marine products".
- 784.131 "At sea".

- 784.132 "As an incident to, or in conjunction with", fishing operations.
 784.133 The exempt operations.
 784.134 "First processing".
 784.135 "Canning".
 784.136 "Packing".

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(b) (4) EXEMPTION

- 784.137 "Shore" activities exempted under section 13(b) (4).
 784.138 Relationship of exemption to exemption for "offshore" activities.
 784.139 Perishable state of the aquatic product as affecting exemption.
 784.140 Scope of exempt operations in general.
 784.141 Fabrication and handling of supplies for use in named operations.
 784.142 Examples of nonexempt employees.
 "CANNING"
 784.143 Meaning and scope of "canning" as used in section 13(b) (4).
 784.144 "Necessary preparatory operations".
 784.145 Preliminary processing by the canner.
 784.146 Preliminary processing by another employer as part of "canning".
 784.147 Preservation of aquatic products for later canning.
 784.148 Processing of aquatic products for canning and for other disposition.
 784.149 "Hermetically sealing and sterilizing or pasteurizing".
 784.150 "Subsequent operations".
 784.151 Employees "employed in" canning.

PROCESSING, FREEZING, AND CURING

- Sec.
 784.152 General scope of processing, freezing, and curing activities.
 784.153 Typical operations that may qualify for exemption.
 784.154 Named operations performed on previously processed aquatic products.
 784.155 Operations performed after product is rendered nonperishable.
 784.156 Operations performed on byproducts.

MARKETING, STORING, PACKING FOR SHIPMENT, AND DISTRIBUTING

- 784.157 General scope of named operations.
 784.158 Relationship to other operations as affecting exemption.
 784.159 Activities performed in wholesale establishments.

APPLICATION OF SECTION 13(b) (4) IN CERTAIN ESTABLISHMENTS

- 784.160 Establishments exclusively devoted to named operations.

AUTHORITY: §§ 784.0 to 784.159 issued under secs. 1-19 52 Stat. 1060, as amended; 75 Stat. 65; 29 U.S.C. 201-219.

Subpart A—General

INTRODUCTORY

§ 784.0 Purpose.

It is the purpose of this part to provide an official statement of the views of the Department of Labor with respect to the application and meaning of those provisions of the Fair Labor Standards Act which govern rights and obligations of employees and employers in the various enterprises engaged in fishing and related activities and in operations on aquatic products. The application of the Act to employment in such enterprises was broadened by amendments effective September 3, 1961. Under the amended Act, a substantial number of employees employed in the processing (other than canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fish, shellfish, or other aquatic forms of animal or vegetable life and their by-products will be

subject to its minimum wage provisions for the first time. Also, certain employers engaged in some of these activities may have employees who are newly subject to the Act under the amendments extending coverage to employees employed in specified enterprises engaged in commerce or in the production of goods for commerce. An exemption from minimum wages as well as overtime pay has been extended by the 1961 amendments to certain employees employed in canning of marine products at sea. It is an objective of this part to make available in one place, for the information of those who may be concerned with these and related provisions of the law, the official interpretations of such provisions by which the Department of Labor will be guided in carrying out its responsibilities under the Act.

§ 784.1 General scope of the Act.

The Fair Labor Standards Act, as amended, is a Federal statute of general application which establishes minimum wage, overtime pay, and child labor requirements that apply as provided in the Act. Employers and employees in enterprises engaged in fishing and related activities, or in operations on aquatic products on shore, need to know how the Act applies to employment in these enterprises so that they may understand their rights and obligations under the law. All employees whose employment have the relationship to interstate or foreign commerce which the Act specifies are subject to the prescribed labor standards unless specifically exempted from them. Employers having such employees are required to comply with the Act's provisions in this regard and with specified record-keeping requirements contained in Part 516 of this chapter. The law authorizes the Department of Labor to investigate or compliance and in the event of violations, to supervise the payment of unpaid minimum wages or unpaid overtime compensation owing to any employee. The law also provides for enforcement in the courts.

§ 784.2 Matters discussed in this part.

This part discusses generally the provisions of the Act which govern its application to employers and employees in enterprises and establishments of the fisheries, seafood processing, and related industries. It discusses in some detail those exempt provisions of the Act in sections 13(a) (5) and 13(b) (4) which refer specifically to employees employed in described activities with respect to seafood and other forms of aquatic life.

§ 785.3 Matters discussed in other interpretations.

Interpretations having general application to others subject to the law, as well as to fishermen and seafood canners, processors, or distributors and their employees, have been issued on a number of subjects of general interest. These will be found in other parts of this chapter. Reference should be made to them for guidance on matters which they discuss in detail, which this part does not undertake to do. They include Part 777 of this chapter, discussing methods of payment of wages; Part 778 of this chapter, discussing computation and payment of overtime compensation; Part 785 of this chapter, discussing the calculation of hours worked; Part 791 of this

chapter, discussing joint employment relationships; and Part 776 of this chapter, discussing the general coverage provisions of the Act. Reference should also be made to Subpart 3 of Part 4 of this title, which contains the official interpretations of the child labor provisions of the Act.

§ 784.4 Significance of official interpretations.

The regulations in this part contain the official interpretations of the Department of Labor pertaining to the exemptions provided in sections 13(a) (5) and 13(b) (4) of the Fair Labor Standards Act of 1938, as amended. It is intended that the positions stated will serve as "a practical guide to employers and employees as to how the office representing the public interest in its enforcement will seek to apply it" (*Skidmore v. Swift*, 323 U.S. 134, 138). These interpretations indicate the construction of the law which the Secretary of Labor and the Administrator believe to be correct and which will guide them in the performance of their duties under the Act, unless and until they are otherwise directed by authoritative decisions of the courts or conclude upon the re-examination of an interpretation that it is incorrect. The interpretations contained herein may be relied upon in accordance with section 10 of the Portal-to-Portal Act (29 U.S.C. 251-262), so long as they remain effective and are not modified, amended, rescinded, or determined by judicial authority to be incorrect.

§ 784.5 Basic support for interpretations.

The ultimate decisions on interpretations of the Act are made by the courts (*Mitchell v. Zachry*, 362 U.S. 310; *Kirschbaum v. Walling*, 316 U.S. 517). Court decisions supporting interpretations contained in this part are cited where it is believed they will be helpful. On matters which have not been determined by the courts, it is necessary for the Secretary of Labor and the Administrator to reach conclusions as to the meaning and the application of provisions of the law in order to carry out their responsibilities of administration and enforcement (*Skidmore v. Swift*, 323 U.S. 134). In order that these positions may be made known to persons who may be affected by them, official interpretations are issued by the Administrator on the advice of the Solicitor of Labor, as authorized by the Secretary (Reorganization Plan 6 of 1950, 64 Stat. 1263; Gen. Ord. 45A, May 24, 1950; 15 F.R. 3290). As included in the regulations in this part, these interpretations are believed to express the intent of the law as reflected in its provisions and as construed by the courts and evidenced by its legislative history. References to pertinent legislative history are made in this part where it appears that they will contribute to a better understanding of the interpretations.

§ 784.6 Interpretations made, continued, and superseded by this part.

On and after publication of this Part 784 in the FEDERAL REGISTER, the interpretations contained therein shall be in effect and shall remain in effect until they are modified, rescinded or withdrawn. This part supersedes and replaces the interpretations previously published in the FEDERAL REGISTER and

Code of Federal Regulations as Part 784 of this chapter. Prior opinions, rulings, and interpretations and prior enforcement policies which are not inconsistent with the interpretations in this part or with the Fair Labor Standards Act as amended by the Fair Labor Standards Amendments of 1961 are continued in effect; all other opinions, rulings, interpretations, and enforcement policies on the subjects discussed in the interpretations in this part are rescinded and withdrawn. The interpretations in this part provide statements of general principles applicable to the subjects discussed and illustrations of the application of these principles to situations that frequently arise. They do not and cannot refer specifically to every problem which may be met by employers and employees in the application of the Act. The omission to discuss a particular problem in this part or in interpretations supplementing it should not be taken to indicate the adoption of any position by the Secretary of Labor or the Administrator with respect to such problem or to constitute an administrative interpretation or practice or enforcement policy. Questions on matters not fully covered by this part may be addressed to the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, Washington 25, D.C., or to any Regional Office of the Divisions.

SOME BASIC DEFINITIONS

§ 784.7 Definition of terms used in the Act.

The meaning and application of the provisions of law discussed in this part depend in large degree on the definition of terms used in these provisions. The Act itself defines some of these terms. Others have been defined and construed in decisions of the courts. In the following sections some of these basic definitions are set forth for ready reference in connection with the part's discussion of the various provisions in which they appear. These definitions and their application are further considered in other interpretative bulletins to which reference is made, and in the sections of this part where the particular provisions containing the defined terms are discussed.

§ 784.8 "Employer", "employee", and "employer".

The Act's major provisions impose certain requirements and prohibitions on every "employer" subject to their terms. The employment by an "employer" of an "employee" is, to the extent specified in the Act, made subject to minimum wage and overtime pay requirements and to prohibitions against the employment of oppressive child labor. The Act provides its own definitions of "employer", "employee", and "employer", under which the "economic reality" rather than "technical concepts" determines whether there is employment subject to its terms (*Goldberg v. Whitaker House Cooperative*, 366 U.S. 28; *United States v. Silk*, 331 U.S. 704; *Rutherford Food Corp. v. McComb*, 331 U.S. 772). An "employer", as defined in section 3(d) of the Act, includes any person acting directly or indirectly in the interest of an employer in relation to an employee but shall not include the United States or any State or political subdivision of a State, or any labor organization (other than when acting as an employer), or anyone acting in the capacity

of officer or agent of such labor organization". An "employee", as defined in section 3(e) of the Act, "includes any individual employed by an employer", and "employer", as used in the Act, is defined in section 3(g), to include "to suffer or permit to work". It should be noted, as explained in Part 791 of this chapter, dealing with joint employment, that in appropriate circumstances two or more employers may be jointly responsible for compliance with the statutory requirements applicable to employment of a particular employee. It should also be noted that "employer", "enterprise", and "establishment" are not synonymous terms, as used in the Act. An employer may have an enterprise with more than one establishment, or he may have more than one enterprise, in which he employs employees within the meaning of the Act. Also, there may be different employers who employ employees in a particular establishment or enterprise.

§ 784.9 "Person".

As used in the Act (including the definition of "enterprise" set forth below in § 784.10), "person" is defined as meaning "an individual, partnership, association, corporation, business trust, legal representative, or any organized group of persons" (Act, section 3(a)).

§ 784.10 "Enterprise".

The term "enterprise" which may, in some situations, be pertinent in determining coverage of this Act to employees employed by employers engaged in the procurement, processing, or distribution of aquatic products, is defined in section 3(r) of the Act. Section 3(r) states:

Enterprise means the related activities performed (either through unified operation or common control) by any person or persons for a common business purpose, and includes all such activities whether performed in one or more establishments or by one or more corporate or other organizational units including departments of an establishment operated through leasing arrangements, but shall not include the related activities performed for such enterprise by an independent contractor * * *.

The scope and application of this definition is discussed in Part 776 of this chapter and in §§ 779.200-779.235 of this chapter.

§ 784.11 "Establishment".

As used in the Act (including the provision quoted below in § 784.12), the term "establishment", which is not specially defined therein, refers to a "distinct physical place of business" rather than to "an entire business or enterprise" which may include several separate places of business. This is consistent with the meaning of the term as it is normally used in business and in government, is judicially settled, and has been recognized in the Congress in the course of enactment of amendatory legislation (*Phillips v. Walling*, 324 U.S. 490; *Mitchell v. Bekins Van & Storage Co.*, 352 U.S. 1027; 95 Cong. Rec. 12565, 12579, 14877; H. Rept. No. 1455, 81st Cong., 1st Sess., p. 25). This is the meaning of the term as used in sections 3(r), 3(s), and 6(b) of the Act.

§ 784.12 "Enterprise engaged in commerce or in the production of goods for commerce".

Portions of the definition of "enterprise engaged in commerce or in the

production of goods for commerce" (Act, section 3(s)) which may in some situations determine the application of provisions of the Act to employees employed by employers engaged in the procurement, processing, or distribution of aquatic products are as follows:

(s) "Enterprise engaged in commerce or in the production of goods for commerce" means any of the following in the activities of which employees are so engaged, including employees handling, selling, or otherwise working on goods that have been moved or produced for commerce by any person:

(3) any establishment of any such enterprise * * * which has employees engaged in commerce or in the production of goods for commerce if the annual gross volume of sales of such enterprise is not less than \$1,000,000.

Provided, That an establishment shall not be considered to be an enterprise engaged in commerce or in the production of goods for commerce, or a part of an enterprise engaged in commerce or in the production of goods for commerce, and the sales of such establishment shall not be included for the purpose of determining the annual gross volume of sales of any enterprise for the purpose of this subsection, if the only employees of such establishment are the owner thereof or persons standing in the relationship of parent, spouse, or child of such owner.

The application of this definition is considered in Part 776 of this chapter.

§ 784.13 "Commerce".

"Commerce" as used in the Act includes interstate and foreign commerce. It is defined in section 3(b) of the Act to mean "trade, commerce, transportation, transmission, or communication among the several States or between any State and any place outside thereof." For the definition of "State", see § 784.16.) The application of this definition and the kinds of activities which it includes are discussed at length in Part 776 of this chapter dealing with the general coverage of the Act.

§ 784.14 "Production".

To understand the meaning of "production" of goods for commerce as used in the Act it is necessary to refer to the definition in section 3(j) of the term "produced". A detailed discussion of the application of the term as defined is contained in Part 776 of this chapter, dealing with the general coverage of the Act. Section 3(j) provides that "produced" as used in the Act "means produced, manufactured, mined, handled, or in any other manner worked on in any State; and for the purposes of this Act an employee shall be deemed to have been engaged in the production of goods if such employee was employed in producing, manufacturing, mining, handling, transporting, or in any other manner working on such goods, or in any closely related process or occupation directly essential to the production thereof, in any State." (For the definition of "State" see § 784.16.)

§ 784.15 "Goods".

The definition in section 3(i) of the Act states that "goods", as used in the Act, means "goods (including ships and marine equipment), wares, products, commodities, merchandise, or articles or subjects of commerce of any character, or any part or ingredient thereof, but

does not include goods after their delivery into the actual physical possession of the ultimate consumer thereof other than a producer, manufacturer, or processor thereof." Part 776 of this chapter, dealing with the general coverage of the Act, contains a detailed discussion of the application of this definition and what is included in it.

§ 784.16 "State".

As used in the Act, "State" means "any State of the United States or the District of Columbia or any Territory or possession of the United States" (Act, section 3(c)). The application of this definition in determining questions of coverage under the Act's definition of "commerce" and "produced" (see §§ 784.13, 784.14) is discussed in Part 776 of this chapter, dealing with general coverage.

§ 784.17 "Regular rate".

As explained in Part 778 of this chapter, dealing with overtime compensation, employees subject to the overtime pay provisions of the Act must generally receive for their overtime work in any workweek as provided in the Act not less than one and one-half times their regular rates of pay. Section 7(d) of the Act defines the term "regular rate" "to include all remuneration for employment paid to, or on behalf of, the employee" except certain payments which are expressly described in and excluded by the statutory definition. This definition, which is discussed at length in Part 778 of this chapter, determines the regular rate upon which time and one-half overtime compensation must be computed under section 7(a) of the Act for employees within its general coverage who are not exempt from the overtime provisions under either of the fishery and seafood exemptions provided by sections 13(a) (15) and 13(b) (4) or under some other exemption contained in the Act. It should be noted that if such an employee is not himself engaged in commerce or in the production of goods for commerce as defined by the Act and in the courts, and within the Act's coverage only by reason of his employment in an enterprise engaged in commerce or in the production of goods for commerce, under the amendments to the Act effective on September 3, 1961, there is no obligation to pay overtime to him until September 3, 1963, as explained below in § 784.25.

APPLICATION OF COVERAGE AND EXEMPTION PROVISIONS OF THE ACT

§ 784.18 Basic coverage in general.

Except as otherwise provided in specific exemptions, the minimum wage, overtime pay, and child labor standards of the Act are generally applicable to employees who engage in specified activities concerned with interstate or foreign commerce. The employment of oppressive child labor in or about establishments producing goods for such commerce is also restricted by the Act. Beginning on September 3, 1961, the monetary and child labor standards of the Act are also generally applicable to other employees, not specifically exempted, who are employed in specified enterprises engaged in such commerce or in the production of goods for such commerce. The monetary standards applicable to all the foregoing employ-

ees, covered under the provisions discussed below in §§ 784.19 and 784.20, are explained subsequently in §§ 784.23 to 784.25 of this Subpart A. The employer must observe these monetary standards with respect to all such employees in his employ except those who may be denied one or both of these benefits by virtue of some specific exemption provision of the Act, such as section 13(a) (9) or 13 (b) (4). It should be noted that enterprises having employees subject to these exemptions may also have other employees who may be exempt under section 13 (a) (1) of the Act, subject to conditions specified in regulations, as employees employed in a bona fide executive, administrative, or professional capacity, or in the capacity of outside salesman. The regulations governing these exemptions are set forth and explained in Part 541 of this chapter.

§ 784.19 Commerce activities of employees.

The Fair Labor Standards Act has applied since 1938 to all employees, not specifically exempted, who are engaged (a) in interstate or foreign commerce or (b) in the production of goods for such commerce, which is defined to include any closely related process or occupation directly essential to such production (29 U.S.C. 206(a), 207(a); and see §§ 784.13 to 784.16 for definitions governing the scope of this coverage). The Act as amended in 1961 continues this coverage. In general, employees of businesses concerned with fisheries and with operations on seafood and other aquatic products are engaged in interstate or foreign commerce, or in the production of goods for such commerce, as defined in the Act, and are subject to the Act's provisions except as otherwise provided in sections 13(a) (5) and 13(b) (4) or other express exemptions. A detailed discussion of the activities in commerce or in the production of goods for commerce which will bring an employee under the Act is contained in Part 776 of this chapter, dealing with general coverage.

§ 784.20 Commerce activities of enterprise in which employee is employed.

Under amendments to the Fair Labor Standards Act effective September 3, 1961 (Pub. Law 87-30, 75 Stat. 65), employees not covered by reason of their personal engagement in interstate commerce activities, as explained in § 784.19, are nevertheless brought within the coverage of the Act if they are employed in an enterprise which is defined in section 3(s) of the Act as an enterprise engaged in commerce or in the production of goods for commerce, or by an establishment described in section 3(s) (3) of the Act (see § 784.12). Such employees, if not exempt from minimum wages and overtime pay under section 13(a) (5) or exempt from overtime pay under section 13(b) (4), will have to be paid in accordance with these monetary standards of the Act unless expressly exempt under some other provision. This would generally be true of employees employed in enterprises and by establishments engaged in the procurement, processing, marketing or distribution of seafood and other aquatic products, where the enterprise has an annual gross sales volume of \$1,000,000 or more. Enterprise coverage is more fully discussed in Part 776 of this chapter, dealing with general coverage.

§ 784.21 Exemptions from the Act's provisions.

The Act provides a number of specific exemptions from the general requirements previously described. Some are exemptions from the overtime provisions only. Others are from the child labor provisions only. Several are exemptions from both the minimum wage and the overtime requirements of the Act. Finally, there are some exemptions from all three—minimum wage, overtime pay, and child labor requirements. An examination of the terminology in which the exemptions from the general coverage of the Fair Labor Standards Act are stated discloses language patterns which reflect congressional intent. Thus, Congress specified in varying degree the criteria for application of each of the exemptions and in a number of instances differentiated as to whether employees are to be exempt because they are employed by a particular kind of employer, employed in a particular type of establishment, employed in a particular industry, employed in a particular capacity or occupation, or engaged in a specified operation. (See 29 U.S.C. 203(d); 207 (b), (c), (h); 213 (a), (b), (c), (d). And see Addison v. Holly Hill, 322 U.S. 607; Mitchell v. Trade Winds, Inc., 289 F. 2d 278; Mitchell v. Stinson, 217 F. 2d 210.) In general, there are no exemptions from the child labor requirements that apply in enterprises or establishments engaged in fishing or in operations on aquatic products see Part 4, Subpart G of this Title). Such enterprises or establishments will, however, be concerned with the exemption from overtime pay in section 13(b) (4) of the Act for employees employed in specified "on-shore" operations (see § 784.101) and the exemption from minimum wages and overtime pay provided by section 13(a) (5) for employees employed in fishing, fish-farming, and other specified "off-shore" operations on aquatic products. These exemptions, which are subject to the general rules stated in § 784.22, are discussed at length in Subpart B of this Part 784.

§ 784.22 Guiding principles for applying coverage and exemption provisions.

It is clear that Congress intended the Fair Labor Standards Act to be broad in its scope. "Breadth of coverage is vital" to its mission" (Powell v. U.S. Cartridge Co., 339 U.S. 497). An employer who claims an exemption under the Act has the burden of showing that it applies (Walling v. General Industries, Inc., 330 U.S. 545; Mitchell v. Kentucky Finance Co., 359 U.S. 290; Tobin v. Blue Channel Corp., 198 F. 2d 245, approved in Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891; Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52). Conditions specified in the language of the Act are "explicit prerequisites to exemption" (Arnold v. Kanowsky, 361 U.S. 388). In their application, the purpose of the exemption as shown in its legislative history as well as its language should be given effect. However, "the details with which the exemptions in this Act have been made precise their enlargement by implication" and "no matter how broad the exemption, it is meant to apply only to" the specified activities (Addison v. Holly Hill, 322 U.S. 607; Maneja v. Waliala, 349 U.S. 254). Exemptions provided in the

Act "are to be narrowly construed against the employer seeking to assert them" and their application limited to those who come "plainly and unmistakably within their terms and spirit." This construction of the exemptions is necessary to carry out the broad objectives for which the Act was passed (Phillips v. Walling, 324 U.S. 490; Mitchell v. Kentucky Finance Co., supra; Arnold v. Kanowsky, supra; Calaf v. Gonzalez, 127 F. 2d 934; Bowie v. Gonzalez, 117 F. 2d 11; Mitchell v. Stinson, 217 F. 2d 210; Fleming v. Hawkeye Pearl Button Co., 113 F. 2d 52).

§ 784.23 Minimum wages and overtime pay for "old" and "new" coverage.

Under the Act as amended in 1961, an employer may have some employees subject to its minimum wage, overtime pay, or child labor provisions who would be covered by such provisions under the "old" law even if the amendments had not been enacted, and other employees whose coverage under such provisions was provided for the first time by the 1961 amendments. As previously explained, such provisions of the Act, as amended, may apply to an employee by reason of the activities in which he is individually engaged, or because he is employed in an enterprise whose activities satisfy the conditions prescribed in the law. However, the minimum wage rates and overtime pay provisions will not be uniform for all such employees until September 3, 1965. On and after that date, every such employee subject to the minimum wage provisions will be entitled to not less than \$1.25 an hour and every such employee subject to the overtime provisions will be entitled to overtime pay for all hours worked in excess of 40 in a workweek at a rate not less than one and one-half times his regular rate of pay. In contrast, during the period beginning with the effective date of the 1961 amendments on September 3, 1961 and ending September 2, 1965, the minimum wage rates applicable to employees subject to the minimum wage provisions, and the overtime pay provisions applicable to such employees who are not specifically exempt therefrom, will be different for employees in employment brought under the Act for the first time by the amendments than for employees whose coverage may be based on the "old" provisions of the Act. During this period employees whose coverage depends on the "new" provisions may be paid a lower minimum wage rate than those covered under the "old" provisions and may be employed for a longer workweek without overtime pay, as specified in the Act. Accordingly, employers who do not wish to pay to all covered employees the minimum wages and overtime pay required for employees covered under the "old" provisions will need to identify those employees who are covered under the "old" and those who are covered under the "new" provisions when wages are computed and paid under the Act.

§ 784.24 Pay standards for employees subject to "old" coverage of the Act.

The 1961 amendments did not change the tests described in § 784.20 by which coverage based on the employee's individual activities is determined. Any employee whose employment satisfies these tests and would not have come within some exemption (such as section

13(a) (5)) in the Act prior to the 1961 amendments is subject to the "old" provisions of the law and entitled to a minimum wage of at least \$1.15 an hour beginning September 3, 1961 and not less than \$1.25 an hour beginning September 3, 1963 (29 U.S.C. 206(a) (1)), unless expressly exempted by some provision of the amended Act. Such an employee is also entitled to overtime pay for hours worked in excess of 40 in any workweek at a rate not less than one and one-half times his regular rate of pay (29 U.S.C. 207(a) (1)), unless expressly exempted from overtime by some exemption such as section 13(b) (4). (Minimum wage rates in Puerto Rico, the Virgin Islands, and American Samoa are governed by special provisions of the Act (29 U.S.C. 206(a) (3); 206(c).) Information on these rates is available at any office of the Wage and Hour and Public Contracts Divisions.

§ 784.25 Pay standards for "newly covered" employees.

There are some employees whose individual activities would not bring them within the minimum wage or overtime pay provisions of the Act as it was prior to the 1961 amendments, but who are brought within minimum wage or overtime coverage or both for the first time by the new "enterprise" coverage provisions or changes in exemptions, or both, which were enacted as part of the amendments and made effective September 3, 1961. Typical of such employees are those who, regardless of any engagement in commerce or in the production of goods for commerce, were exempt from minimum wages as well as overtime pay by virtue of section 13(a) (5) of the Act until the 1961 amendments, but who by virtue of these amendments are exempt only from overtime pay on and after September 3, 1961, under the amended section 13(d) (4) of the Act. These "newly covered" employees for whom no specific exemption has been retained or provided in the amendments must be paid not less than the minimum wages for hours worked and unless exempted by section 13(d) (4) or some other provision, not less than one and one-half times their regular rates of pay (see § 784.18) for overtime, as shown in the following schedule:

Beginning:	Minimum wage (29 U.S.C. 206(b))	Overtime pay (29 U.S.C. 207(a)(2))
Sept. 3, 1961— Sept. 3, 1963—	\$1 an hour— No change.	None required— After 40 hours in a workweek.
Sept. 3, 1964—	\$1.15 an hour—	After 42 hours in a workweek.
Sept. 3, 1965 + and thereafter.	\$1.25 an hour—	After 40 hours in a workweek.

¹ Requirements identical to those for employees under "old" coverage. (Minimum wage rates for newly covered employees in Puerto Rico, the Virgin Islands, and American Samoa are set by wage order on recommendations of special industry committees (29 U.S.C. 206(a)(3); 206(c).) Information on these rates is available at any Office of the Wage and Hour and Public Contracts Divisions.)

Subpart B—Exemption Provisions Relating to Fishing and Aquatic Products

THE STATUTORY PROVISIONS

§ 784.100 The section 13(a) (5) exemption.

Section 13(a) (5) grants an exemption from both the minimum wage and the

overtime requirements of the Act and applies to "any employee employed in the catching, taking, propagating, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, or in the first processing, canning or packing of such marine products at sea as an incident to, or in conjunction with, such fishing operations, including the going to and returning from work and loading and unloading when performed by any such employee."

§ 784.101 The section 13(b) (4) exemption.

Section 13(b) (4) grants an exemption only from the overtime requirements of the Act and applies to "any employee employed in the canning, processing, marketing, freezing, curing, storing, packing for shipment, or distributing of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof."

LEGISLATIVE HISTORY OF EXEMPTIONS

§ 784.102 General legislative history.

(a) As originally enacted in 1938, the Fair Labor Standards Act provided an exemption from both the minimum wage requirements of section 6 and the overtime pay requirements of section 7 which was made applicable to "any employee employed in the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, including the going to and returning from work and including employment in the loading, unloading, or packing of such products for shipment or in propagating, processing, marketing, freezing, canning, curing, storing, or distributing the above products or byproducts thereof" (52 Stat. 1069, sec. 13(a) (5)).

(b) In 1949 the minimum wage was extended to employees employed in canning such products by deleting the word "canning" from the above exemption, adding the parenthetical phrase "(other than canning)" after the word "processing" therein, and providing a new exemption in section 13(b) (4), from overtime pay provisions only, applicable to "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof". All other employees included in the original minimum wage and overtime exemption remained within it (63 Stat. 910).

(c) By the Fair Labor Standards Amendments of 1961, effective September 3, 1961 (75 Stat. 65), both these exemptions were further revised to read as set forth in §§ 784.100 and 784.101. The effect of this change was to provide a means of equalizing the application of the Act as between canning employees and employees employed in other processing, marketing, and distributing of aquatic products on shore, to whom minimum wage protection, formerly provided only for canning employees, was extended by this action. The 1961 amendments, however, left employees employed in fishing, in fish farming, and in related occupations concerned with procurement of aquatic products from nature, under the existing exemption from minimum wages as well as overtime pay.

§ 784.103 Adoption of the exemption in the original 1938 Act.

Although in the course of consideration of the legislation in Congress before passage in 1938, provisions to exempt employment in fishery and aquatic products activities took various forms, section 13(a)(5), as drafted by the conference committee and finally approved, followed the language of an amendment adopted during consideration of the bill by the House of Representatives on May 24, 1938, which was proposed by Congressman Bland of Virginia. He had, earlier on the same day, offered an amendment which had as its objective the exemption of the "fishery industry", broadly defined. This amendment had been defeated (83 Cong. Rec. 7408), as had an amendment subsequently offered by Congressman Mott of Oregon (to a pending amendment proposed by Congressman Coffey of Nebraska) which would have provided an exemption for "industries engaged in producing, processing, distributing, or handling * * * fishery or seafood products which are seasonal or perishable" (83 Cong. Rec. 7421-7423). Against this background, when Congressman Bland offered his amendment which ultimately became section 13(a)(5) of the Act he took pains to explain: "This amendment is not the same. In the last amendment I was trying to define the fishery industry. I am now dealing with those persons who are exempt, and I call the attention of the Committee to the language with respect to the employment of persons in agriculture * * * I am only asking for the seafood and fishery industry that which has been done for agriculture." It was after this explanation that the amendment was adopted (83 Cong. Rec. 7443). When the conference committee included in the final legislation this provision from the House bill, it omitted from the bill another House provision granting an hours exemption for "employees in any place of employment" where the employer was "engaged in the processing of or in canning fresh fish or fresh seafood" and the provision of the Senate bill providing an hours exemption for employees "employed in connection with" the canning or other packing of fish, etc. (see Mitchell v. Stinson, 217 F. 2d 210; McComb v. Consolidated Fisheries, 75 F. Supp. 798). The indication in this legislative history that the exemption in its final form was intended to depend upon the employment of the particular employee in the specified activities is in accord with the position of the Department of Labor and the weight of judicial authority.

§ 784.104 The 1949 amendments.

In deleting employees employed in canning aquatic products from the section 13(a)(5) exemption and providing them with an exemption in like language from the overtime provisions only in section 13(b)(4), the conferees on the Fair Labor Standards Amendments of 1949 did not indicate any intention to change in any way the category of employees who would be exempt as "employees in the canning of" the aquatic products. As the Supreme Court has pointed out in a number of decisions, "When Congress amended the Act in 1949 it provided that pre-1949 rulings and interpretations by the Administrator should remain in effect unless inconsistent with

the statute as amended 63 Stat. 920" (Mitchell v. Kentucky Finance Co., 359 U.S. 280). In connection with this exemption the conference report specifically indicates what operations are included in the canning process (see § 784.143). In a case decided before the 1961 amendments to the Act, this was held to "indicate that Congress intended that only those employees engaged in operations physically essential to the canning of fish, such as cutting the fish, placing it in cans, labelling and packing the cans for shipment are in the exempt category" (Mitchell v. Stinson, 217 F. 2d 210).

§ 784.105 The 1961 amendments.

(a) The Statement of the Managers on the Part of the House in the conference report on the Fair Labor Standards Amendments of 1961 (H. Rep. No. 327, 87th Cong., 1st Sess., p. 16) refers to the fact that the changes made in sections 13(a)(5) and 13(b)(4) originated in the Senate amendment to the House bill and in the bill as passed by the House. In describing the Senate provision which was retained in the final legislation, the Managers stated that it "changes the exemption in the act for" the operations transferred to section 13(b)(4) from section 13(a)(5) "from a minimum wage and overtime exemption to an overtime only exemption." They further stated: "The present complete exemption is retained for employees employed in catching, propagating, taking, harvesting, cultivating, or farming fish and certain other marine products, or in the first processing, canning, or packing such marine products as sea as an incident to, or in conjunction with, such fishing operations, including the going to and returning from work and loading and unloading when performed by such an employee." In the report of the Senate committee on the provision included in the Senate bill (S. Rep. No. 145, 87th Cong., 1st Sess., p. 33) the committee stated: "The bill will modify the minimum wage and overtime exemption in section 13(a)(5) of the act for employees engaged in fishing and in specified activities on aquatic products." In further explanation, the report states that the bill would amend this section "to remove from this exemption those so-called onshore activities and leave the exemption applicable to 'offshore' activities connected with the procurement of the aquatic products, including first processing, canning or packing at sea performed as an incident to fishing operations, as well as employment in loading and unloading such products for shipment when performed by any employee engaged in these procurement operations." It is further stated in the report that "persons who are employed in the activities removed from the section 13(a)(5) exemption will have minimum wage protection but will continue to be exempt from the Act's overtime requirements under an amended section 13(b)(4). The bill will thus have the effect of placing fish processing and fish canning on the same basis under the Act. There is no logical reason for treating them differently and their inclusion within the Act's protection is desirable and consistent with its objectives."

(b) The Language of the Managers on the Part of the House in the conference report and of the Senate committee in its report, as quoted above, is consistent

with the position supported by the earlier legislative history and by the courts, that the exemption for employees engaged in these provisions of the Act depends on what he does. The Senate report speaks of the exemption "for employees engaged in fishing and in specified activities" and of the "activities now enumerated in this section". While this language confirms the legislative intent to continue to provide exemption for employees employed in specified activities rather than to grant exemption on an industry, employer, or establishment basis (see Mitchell v. Trade Winds, Inc., 289 F. 2d 278), the report also refers with apparent approval to certain prior judicial interpretations indicating that the list of activities set out in the exemption provisions is intended to be "a complete catalog of the activities involved in the fishery industry" and that an employee, to be exempt, need not engage directly in the physical acts of catching, processing, canning, etc. of aquatic products which are included in the operations specifically named in the statute (McComb v. Consolidated Fisheries Co., 174 F. 2d 74). It was stated that an interpretation of section 13(a)(5) and section 13(b)(4) which would include within their purview "any employee who participates in activities which are necessary to the conduct of the operations specifically described in the exemptions" is "consistent with the congressional purpose" of the 1961 amendments. (See Sen. Rep. No. 145, 87th Cong., 1st sess., p. 33; Statement of Representative Roosevelt, 107 Cong. Rec. (daily ed.) p. 6716, as corrected May 4, 1961.) From this legislative history the intent is apparent that the application of these exemptions under the Act as amended in 1961 is to be determined by the practical and functional relationship of the employee's work to the performance of the operations specifically named in section 13(a)(5) and section 13(b)(4).

PRINCIPLES APPLICABLE TO THE TWO EXEMPTIONS

§ 784.106 Relationship of employee's work to the named operations.

It is clear from the language of section 13(a)(5) and section 13(b)(4) of the Act, and from their legislative history as discussed in §§ 784.102-784.105, that the exemptions which they provide are applicable only to those employees who are "employed in" the named operations. Under the Act as amended in 1961 and in accordance with the evident legislative intent (see § 784.105), an employee will be considered to be "employed in" an operation named in section 13(a)(5) or 13(b)(4) where his work is an essential and integrated step in performing such named operation (see Mitchell v. Myrtle Grove Packing Co., 350 U.S. 891, approving *Tobin v. Blue Channel Corp.*, 198 F. 2d 245; Mitchell v. Stinson, 217 F. 2d 210), or where the employee is engaged in activities which are functionally so related to a named operation under the particular facts and circumstances that they are necessary to the conduct of such operation and his employment is, as a practical matter, necessarily and directly a part of carrying on the operation for which exemption was intended (Mitchell v. Trade Winds, Inc., 289 F. 2d 278; see also *Waller v. Humphreys*, 133 F. 2d 193 and *McComb v. Consolidated Fisheries Co.*, 174 F. 2d 74). Under these prin-

ciples, generally an employee performing functions without which the named operations could not go on is, as a practical matter, "employed in" such operations. It is also possible for an employee to come within the exemption provided by section 13(a) (5) or section 13(b) (4) even though he does not directly participate in the physical acts which are performed on the enumerated marine products in carrying on the operations which are named in that section of the Act. However, it is not enough to establish the applicability of such an exemption that an employee is hired by an employer who is engaged in one or more of the named operations or that the employee is employed by an establishment or in an industry in which operations enumerated in section 13(a) (5) or section 13(b) (4) are performed. The relationship between what he does and the performance of the named operations must be examined to determine whether an application of the above-stated principles to all the facts and circumstances will justify the conclusion that he is "employed in" such operations within the intentment of the exemption provision.

§ 784.107 Relationship of employee's work to operations on the specified aquatic products.

It is also necessary to the application of the exemptions that the operations of which the employee's work is a part be performed on the marine products named in the Act. Thus, the operations described in section 13(a) (5) must be performed with respect to "any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life". The operations enumerated in section 13(b) (4) must be performed with respect to "any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any by-product thereof". Work performed on products which do not fall within these descriptions is not within the exemptions (*Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52; *Mitchell v. Trade Winds, Inc.*, 289 F. 2d 278; *Walling v. Haden*, 153 F. 2d 196).

§ 784.108 Operations not included in named operations on forms of aquatic "life".

Since the subject matter of the exemptions is concerned with "aquatic forms of animal and vegetable life", the courts have held that the manufacture of buttons from clam shells or the dredging of shells to be made into lime and cement are not exempt operations because the shells are not living things (*Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52; *Walling v. Haden*, 153 F. 2d 196, certiorari denied 328 U.S. 866). Similarly, the production of such items as crushed shell and grit, shell lime, pearl buttons, knife handles, novelties, liquid glue, isinglass, pearl essence and fortified or refined fish oil is not within these exemptions.

§ 784.109 Manufacture of supplies for named operations is not exempt.

Employment in the manufacture of supplies for the named operations is not employment in the named operations on aquatic forms of life. Thus, the exemption is not applicable to the manufacture of boxes, barrels, or ice by a seafood processor for packing or shipping its seafood products or for use of the ice in its

fishing vessels. These operations, when performed by an independent manufacturer, would likewise not be exempt (*Dize v. Maddrix*, 144 F. 2d 284 (C.A. 4), affirmed 324 U.S. 697, and approved on this point in *Farmers' Reservoir Co. v. McComb*, 337 U.S. 755).

§ 784.110 Performing operations both on nonaquatic products and named aquatic products.

By their terms, sections 13(a) (5) and 13(b) (4) provide no exemption with respect to operations performed on any products other than the aquatic products named in these subsections (see § 784.107). Accordingly, neither of the exemptions is applicable to the making of any commodities from ingredients only part of which consist of such aquatic products, if a substantial amount of other products is contained in the commodity so produced (compare *Walling v. Bridgeman-Russell Co.*, 6 Labor Cases 61,422, 2 WH Cases 78 (D. Minn.), and *Miller v. Litchfield Creamery Co.*, 11 Labor Cases 63,247, 5 WH Cases 1,039 (N.D. Ind.), with *Mitchell v. Trade Winds, Inc.*, 289 F. 2d 278). Thus, the first processing, canning, or processing of codfish cakes, clam chowder, dog food, crabcakes, or livestock food containing aquatic products is often not exempt within the meaning of the relevant exemptions.

§ 784.111 Operations on named products with substantial amounts of other ingredients are not exempt.

To exempt employees employed in first processing, canning, or processing products composed of the named commodities and a substantial amount of ingredients not named in the exemptions would be contrary to the language and purposes of such exemptions which specifically enumerate the commodities on which exempt operations were intended to be performed. Consequently, in such situations all operations performed on the mixed products at and from the time of the addition of the foreign ingredients, including those activities which are an integral part of first processing, canning or processing are non-exempt activities. However, activities performed in connection with such operations on the named aquatic products prior to the addition of the foreign ingredients are deemed exempt operations under the applicable exemption. Where the commodity produced from named aquatic products contains an insubstantial amount of products not named in the exemption, the operations will be considered as performed on the aquatic products and handling and preparation of the foreign ingredients for use in the exempt operations will also be considered as exempt activities.

§ 784.112 Substantial amounts of non-aquatic products; enforcement policy.

As an enforcement policy in applying the principles stated in §§ 784.110 and 784.111, if more than 20 percent of a commodity consists of products other than aquatic products named in section 13(a) (5) or 13(b) (4), the commodity will be deemed to contain a substantial amount of such nonaquatic products.

§ 784.113 Work related to named operations performed in off- or dead-season.

Generally, during the dead or inactive season when operations named in sec-

tion 13(a) (5) or 13(b) (4) are not being performed on the specified aquatic forms of life, employees performing work relating to the plant or equipment which is used in such operations during the active season are not exempt. Illustrative of such employees are those who repair, overhaul, or recondition fishing equipment or processing or canning equipment and machinery during the off-season periods when fishing, processing, or canning is not going on. An exemption provided for employees employed "in" specified operations is plainly not intended to apply to employees employed in other activities during periods when the specified operations are not being carried on, where their work is functionally remote from the actual conduct of the operations for which exemption is provided and is unaffected by the natural factors which the Congress relied on as reason for exemption. The courts have recognized these principles. See *Maneja v. Waiata*, 341 U.S. 254; *Mitchell v. Sinson*, 217 F. 2d 210; *Maneja v. Central Coloso*, 6 Labor Cases (CCH) par. 61,337, 2 WH Cases 753 (D. P.R.); *Abram v. San Joaquin Cotton Oil Co.*, 49 F. Supp. 393 (S.D. Calif.), and *Hea-burn v. Independent Oil Mill Inc.*, 46 F. Supp. 751 (W.D. Tenn.). On the other hand, there may be situations where employees performing certain pre-season or post-season activities immediately prior or subsequent to carrying on operations named in section 13(a) (5) or section 13(b) (4) are properly to be considered as employed "in" the named operations because their work is so close in point of time and function to the conduct of the named operations that the employment, as a practical matter, necessarily and directly a part of carrying on the operation for which exemption was intended. Depending on the facts and circumstances, this may be true, for example, of employees who perform such work as placing boats and other equipment in condition for use at the beginning of the fishing season, and taking the necessary protective measures with respect to such equipment which are required in connection with termination of the named operations at the end of the season. Where such work is integrated with and is required for the actual conduct of the named operations on the specified aquatic forms of life, and is necessarily performed immediately before or immediately after such named operations, the employees performing it may be considered as employed in the named operations, so as to come within the exemption. It should be kept in mind that the relationship between the work of an employee and the named operations which is required for exemption is not necessarily identical with the relationship between such work and the production of goods for commerce which is sufficient to establish its general coverage under the Act. Thus, repair, overhaul, and reconditioning work during or in the season which does not come within the exemption is nevertheless closely related and directly essential to the production of goods for commerce which takes place during the active season and, therefore, is subject to the provisions of the Act (*Farmers' Reservoir Co. v. McComb*, 337 U.S. 755; *Mitchell v. Sinson*, 217 F. 2d 11; *Bowie v. Gonzalez*, 117 F. 2d 11; *Weaver v. Pittsburgh Steamship Co.*, 153 F. 2d 597, cert. den. 328 U.S. 858).

§ 784.114 Application of exemptions to a workweek basis.

The general rule is that the unit of time to be used in determining the application of the exemption to an employee is the workweek (see *Overnight Motor Transportation Co. v. Missel*, 316 U.S. 572; *Mitchell v. Stinson*, 217 F. 2d 210; *Mitchell v. Hunt*, 263 F. 2d 913; *Puerto Rico Tobacco Marketing Co.-op. Ass'n v. McComb*, 181 F. 2d 697). Thus, the workweek is the unit of time to be taken as the standard in determining the applicability to an employee of section 13(a)(5) or section 13(b)(4) (*Mitchell v. Stinson*, supra). An employee's workweek is a fixed and regularly recurring period of 168 hours—seven consecutive 24-hour periods. It may begin at any hour of any day set by the employer and need not coincide with the calendar week. Once the workweek has been set it commences each succeeding week on the same day and at the same hour. Changing the workweek for the purpose of escaping the requirements of the Act is not permitted. If in any workweek an employee does only exempt work he is exempt from the wage and hours provisions of the Act during that workweek, irrespective of the nature of his work in any other workweek or workweeks. An employee may thus be exempt in one workweek and not the next (see *Mitchell v. Stinson*, supra). But the burden of effecting segregation between exempt and nonexempt work as between particular workweek is on the employer (see *Tobin v. Blue Channel Corp.*, 198 F. 2d 245).

§ 784.115 Exempt and noncovered work performed during the workweek.

The wage and hours requirements of the Act do not apply to any employee during any workweek in which a portion of his activities falls within section 13(a) if no part of the remainder of his activities is covered by the Act. Similarly, the overtime requirements are inapplicable in any workweek in which a portion of an employee's activities falls within section 13(b)(4) if no part of the remainder of his activities is covered by the Act. Covered activities for purposes of the above statements mean engagement in commerce, or in the production of goods for commerce, or in an occupation closely related or directly essential to such production or employment in an enterprise engaged in commerce or in the production of goods for commerce, as explained in §§ 784.17 and 784.18.

§ 784.116 Exempt and nonexempt work in the same workweek.

Where an employee, during any workweek, performs work that is exempt under section 13(a)(5) or 13(b)(4), and also performs nonexempt work, some part of which is covered by the Act, the exemption will be deemed inapplicable unless the time spent in performing nonexempt work during that week is not substantial in amount. For enforcement purposes, nonexempt work will be considered substantial in amount if more than 20 percent of the time worked by the employee in a given workweek is devoted to such work (see *Mitchell v. Stinson*, 217 F. 2d 210). Where exempt and nonexempt work is performed during a workweek by an employee and is not or cannot be segregated so as to permit separate measurement of the time

spent in each, the employee will not be exempt (see *Tobin v. Blue Channel Corp.*, 198 F. 2d 245; *Walling v. Public Quick Freezing and Cold Storage Co.*, 62 F. Supp. 924).

§ 784.117 Combinations of exempt work.

The combination of exempt work under sections 13(a)(5) and 13(b)(4), or of one of these sections with exempt work under another section of the Act, is permitted. Where a part of an employee's covered work in a workweek is exempt under section 13(a)(5) and the remainder is exempt under another section which grants an exemption from the minimum wage and overtime provisions of the Act, the wage and hours requirements are not applicable. If the scope of the exemption is not the same, however, the exemption applicable to the employee is that provided by whichever exemption provision is more limited in scope unless, of course, the time spent in performing work which is nonexempt under the broader exemption is not substantial. For example, an employee may devote part of his workweek to work within section 13(b)(4) and the remainder to work exempt from both the minimum wage and overtime requirements under another section of the Act. In such a case he must receive the minimum wage but is not required to receive time and one-half for his overtime work during that week (*Cf. Mitchell v. Myrtle Grove Packing Co.*, 350 U.S. 891; *Tobin v. Blue Channel Corp.*, 198 F. 2d 245). Each activity is tested separately under the applicable exemption as though it were the sole activity of the employee for the whole workweek in question. Unless the employee meets all the requirements of each exemption, a combination exemption will not be available.

§ 784.118 Work subject to different minimum wage rates in same workweek.

Work subject to different minimum wage rates in the same workweek calls for application of a rule similar to that generally applied where work subject to two exemptions unequal in scope is involved. For example, section 13(b)(4) exempts both employment in canning and employment in processing other than canning of the named marine products from the overtime requirements, but the minimum wage requirements that must be observed for the two operations will not be the same until September 3, 1965. If employed in canning for his entire workweek, an employee will be entitled to the higher minimum wage rate prescribed by section 6(a) of the Act; if employed in processing other than canning throughout the workweek, he will be entitled only to the lower minimum wage rate prescribed by section 6(b). Prior to the 1961 amendments the situation differed only in that the Act provided a minimum wage exemption for the employment in processing other than canning. An employee employed in canning in a particular workweek was entitled to the minimum wage applicable to such employment, however, even where his processing of aquatic products for canning was intermingled in the same workweek with the processing of such products for other purposes (see *Tobin v. Blue Channel Corp.*, 198 F. 2d 245, approved in *Mitchell v. Myrtle Grove Packing Co.*, 350 U.S. 891).

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(a)(5) EXEMPTION

§ 784.119 The exemption is intended for work affected by natural factors.

As indicated by the legislative history, the purpose of the section 13(a)(5) exemption is to exempt from the minimum wage and overtime provisions of the Act employment in those activities in the fishing industry that are controlled or materially affected by natural factors or elements, such as the vicissitudes of the weather, the changeable conditions of the water, the run of the catch, and the perishability of the products obtained (83 Cong. Rec. 7408, 7443; S. Rep. No. 145, p. 33 on H.R. 3935, 87th Cong., 1st sess.; *Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52; *Walling v. Haden*, 153 F. 2d 196, certiorari denied 328 U.S. 866).

§ 784.120 Effect of natural factors on named operations.

The various activities enumerated in section 13(a)(5)—the catching, taking, propagating, harvesting, culturing, or farming of aquatic forms of animal or vegetable life as well as "the going to and returning from work"—are materially controlled and affected by the natural elements. Similarly, the activities of "first processing, canning or packing of such marine products—at sea as an incident to, or in conjunction with, such fishing operations"—are subject to the natural factors mentioned above. The "loading and unloading" of such aquatic products when performed at sea are also subject to the natural forces.

§ 784.121 Application of exemption to "offshore" activities in general.

The expression "offshore activities" is used to describe the category of named operations pertaining to the acquisition from nature of aquatic forms of animal and vegetable life. As originally enacted in 1938, section 13(a)(5) exempted not only employees employed in such "offshore" or "trip" activities but also employees employed in related activities on shore which were similarly affected by the natural factors previously discussed (see §§ 784.103, and *Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52). However, the intent of the 1961 amendments to the Act was to remove from the exemption the so-called onshore activities and "leave the exemption applicable to 'offshore' activities connected with the procurement of the aquatic products" (S. Rep. 145, 87th Cong., 1st sess., p. 33). Despite its comprehensive reach (see §§ 784.105 and 784.106), the exemption, like the similar exemption in the Act for agriculture, is "meant to apply only" to the activities named in the statute (see *Maneja v. Waiialua*, 349 U.S. 254; *Farmers Reservoir Co. v. McComb*, 337 U.S. 755).

§ 784.122 Exempt fisheries operations.

Employees engaged in the named operations, such as "catching" or "taking," are clearly exempt. As indicated in § 784.106, employees engaged in activities that are "directly and necessarily a part of" an enumerated operation are also exempt (*Mitchell v. Trade Winds, Inc.*, 289 F. 2d 278). The "catching, taking, propagating, harvesting, culturing, or farming" of the various forms of aquatic life includes not only the actual performance of the activities, but also the usual duties inherent in the occupations

of those who perform the activities. Thus, the fisherman who is engaged in "catching" and "taking" must see to it that his lines, nets, seines, traps, and other equipment are not fouled and are in working order. He may also have to mend or replace his lines or nets or repair or construct his traps. Such activities are an integral part of the operations of "catching" and "taking" of an aquatic product.

§ 784.123 Operations performed as an integrated part of fishing.

Certain other activities performed on a fishing vessel in connection with named operations are, functionally and as a practical matter, directly and necessarily a part of such operations. For example, maintenance work performed by members of the fishing crew during the course of the trip on the fishing boat would necessarily be a part of the fishing operation, since the boat itself is as much a fishing instrument as the fishing rods or nets. Similarly, work required on the vessel to keep in good operating condition any equipment used for processing, canning or packing the named aquatic products at sea is so necessary to the conduct of such operations that it must be considered a part of them and exempt.

§ 784.124 Operations performed on fishing equipment.

On the principle stated in § 784.122, the replacement, repair, mending, or construction of the fisherman's equipment performed at the place of the fishing operation would be exempt. Such activities performed in contemplation of the trip are also within the exemption if the work is so closely related both in point of time and function to the acquisition of the aquatic life that it is really a part of the fishing operation or of "going to . . . work." For example, under appropriate facts, the repair of the nets, or of the vessel, or the building of fish trap frames on the shore immediately prior to the opening of the fishing season would be within the exemption. Activities at the termination of a fishing trip which are similarly related in time and function to the actual conduct of fishing operations or "returning from work" may be within the exemption on like principles. Similarly, the fact that the exemption is intended generally for "offshore" activities does not mean that it may not apply to employment in other activities performed on shore which are so integrated with the conduct of actual fishing operations and functionally so necessary thereto that the employment is, in practical effect, directly and necessarily a part of the fishing operations for which the exemption is intended. In such circumstances the exemption will apply, for example, to an employee employed by a vessel owner to watch the fishing vessel, its equipment, and the catch when it comes to port, check the mooring lines, operate bilge pumps and heating and cooling systems on the vessel and assist in the loading and unloading of the fishing equipment and the catch. Work of the kinds referred to may be exempt when performed by the fisherman himself or by some other employee of the fishing organization. However, the ex-

emption would not apply to employees of a manufacturer of supplies or to employees of independent shops which repair boats and equipment (*Dize v. Maddrix*, 144 F. 2d 584 affirmed 324 U.S. 697).

§ 784.125 Going to and returning from work.

The phrase "including the going to and returning from work" relates to the preceding named operations which pertain to the procuring and appropriation of seafood and other forms of aquatic life from nature. The expression obviously includes the time spent by fishermen and others who go to and from the fishing grounds or other locations where the aquatic life is reduced to possession. If going to work requires fishermen to prepare and carry the equipment required for the fishing operation, this would be included within the exemption. In performing such travel the fishermen may be required to row, guide or sail the boat or otherwise assist in its operation. Similarly, if an employee were digging for clams or other shellfish or gathering seaweed on the sand or rocks it might be necessary to drive a truck or other vehicle to reach his destination. Such activities are exempt within the meaning of this language. However, the phrase does not apply to employees who are not employed in the activities involved in the acquisition of aquatic animal or vegetable life, such as those going to or returning from work at processing or refrigerator plants or wholesale establishments.

§ 784.126 Loading and unloading.

The term "loading and unloading" applies to activities connected with the removal of aquatic products from the fishing vessel and their initial movement to market or processing plants. The exemption, however, is not without limitation. The statute by its clear language makes these activities exempt only when performed by any employee employed in the procurement activities enumerated in section 13(a) (5). This limitation is confirmed by the legislative history of the 1961 amendments which effectuated this change in the application of this term (S. Rep. 145, 87th Cong., 1st sess., p. 33). Consequently, members of the fishing crew engaged in loading and unloading the catch of the vessel to another vessel at sea or at the docks would be engaging in exempt activities within the meaning of section 13(a) (5). On the other hand, dock workers performing the same kind of tasks would not be within the exemption.

§ 784.127 Operation of the fishing vessel.

In extending the minimum wage to seamen on American vessels by limiting the exemption from minimum wages and overtime provided by section 13(a) (14) of the Act to "any employee employed as a seaman on a vessel other than an American vessel," and at the same time extending the minimum wage to "onshore" but not "offshore" operations concerned with aquatic products, the Congress, in the 1961 amendments to the Act, did not indicate any intent to remove the crews of fishing vessels engaged in operations named in section

13(a) (5) from the exemption provided by that section. The exemption provided by section 13(a) (14), above noted, and the general exemption in section 13(b) (6) from overtime for "any employee employed as a seaman" (whether or not on an American vessel) apply, in general, to employees, working aboard vessels, whose services are rendered primarily as an aid to navigation. It appears, however, that it is not the custom or practice in the fishing industry for a fishing vessel to have two crews namely a fishing crew whose duty it is primarily to fish and to perform other duties incidental thereto and a navigational crew whose duty it is primarily to operate the boat. Where, as is the typical situation, there is but one crew which performs all these functions, the section 13(a) (5) exemption would apply to its members. For a further explanation of the seaman's exemption see Part 783 of this chapter.

§ 784.128 Office and clerical employees under section 13(a) (5).

Office and clerical employees, such as bookkeepers, stenographers, typists, and others who perform general office work of a firm engaged in operating fishing boats are not for that reason within the section 13(a) (5) exemption. Under the principles stated in § 784.106, their general office activities are not a part of any of the named operations even when they are selling, taking and putting up orders, or recording sales, taking cash or making telephone connections for customer or dealer calls. Employment in the specific activities named in the preceding sentence would ordinarily, however, be exempt under section 13(b) (4) since such activities constitute "marketing" or "distributing" within the meaning of that exemption (see § 784.157). In certain circumstances, office or clerical employees may come within the section 13(a) (5) exemption. If, for example, it is necessary to the conduct of the fishing operations that such employees accompany a fishing expedition to the fishing grounds to perform certain work required there in connection with the catch, their employment under such circumstances may, as a practical matter, be directly and necessarily a part of the operations for which exemption was intended, in which event the exemption would apply to them.

FIRST PROCESSING, CANNING, OR PACKING OF MARINE PRODUCTS UNDER SECTION 13(a) (5)

§ 784.129 Requirements for exemption of first processing, etc., at sea.

A complete exemption from minimum and overtime wages is provided by section 13(a) (5) for employees employed in the operations of first processing, canning, or packing of marine products at sea as an incident to, or in conjunction with "such" fishing operations—that is, the fishing operations of the fishing vessel (S. Rep. 145, 87th Cong., 1st sess., p. 33). To qualify under this part of the exemption, there must be a showing that (1) the work of the employees is such that they are, within the meaning of the Act, employed in one or more of the named operations of first processing, canning or packing, (2) such operations

are performed as an incident to, or in conjunction with, fishing operations of the vessel, (3) such operations are performed at sea, and (4) such operations are performed on the marine products specified in the statute.

§ 784.130 "Marine products."

The marine products which form the basis of the exemption are the "fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life" mentioned in section 13(a)(5). The exemption contemplates aquatic products currently or recently acquired and in the form obtained from the sea, since the language of the exemption clearly indicates the named operations of first processing, canning, or packing must be performed "at sea" and "as an incident to, or in conjunction with," fishing operations. Also, such "marine products" are limited to aquatic forms of "life."

§ 784.131 "At sea."

The "at sea" requirement must be construed in context and in such manner as to accomplish the statutory objective. The section 13(a)(5) exemption is for the "catching, taking, propagating, harvesting," etc., of "aquatic forms of animal and vegetable life." There is no limitation as to where these activities must take place other than, as the legislative history indicates, that they are "offshore" activities. Since the purpose of the 1961 amendments is to exempt the "first processing, canning or packing such marine products at sea as an incident to, or in conjunction with, such fishing operations," it would frustrate this objective to give the phrase "at sea" a technical or special meaning. For example, to define "at sea" to include only bodies of water subject to the ebb and flow of the tides or to saline waters would exclude the Great Lakes which obviously would not comport with the legislative intent. On the other hand, one performing the named activities of first processing, canning, or packing within the limits of a port or harbor is not performing them "at sea" within the meaning of the legislative intent although the situs of performance is subject to tides. In any event it would not appear necessary to draw a precise line as to what constitutes "at sea" operations, for, as a practical matter, such first processing, canning, or packing operations are those closely connected with the physical catching of the fish and are performed on the fishing vessel shortly or immediately following the "catching" and "taking" of the fish.

§ 784.132 "As an incident to, or in conjunction with" fishing operations.

The statutory language makes clear that the "first processing, canning or packing," unlike the other named operations of "catching, taking, propagating, harvesting, cultivating, or farming," are not exempt operations in and of themselves. They are exempt only when performed "as an incident to, or in conjunction with such fishing operations" (see *Farmers Reservoir Co. v. McComb*, 337 U.S. 755). It is apparent from the context that the language "such fishing

operations" refers to the principal named operations of "catching, taking, propagating, harvesting, cultivating, or farming," as performed by the fishermen or fishing vessel (compare *Bowie v. Gonzalez*, 117 F.2d 115). Therefore to be "an incident to, or in conjunction with such fishing operations," the first processing, canning, or packing must take place upon the vessel that is engaged in the physical catching, taking, etc., of the fish. This is made abundantly clear by the legislative history. In Senate Report No. 145, 87th Congress, 1st session, at page 33, it pointed out:

For the same reasons, there was included in section 13(a)(5) as amended by the bill an exemption for the "first processing, canning or packing" of marine products "at sea as an incident to, or in conjunction with such fishing operations." The purpose of this additional provision is to make certain that the Act will be uniformly applicable to all employees on the fishing vessel including those employees on the vessel who may be engaged in these activities at sea as an incident to the fishing operations conducted by the vessel.

In accordance with this purpose of the section, the exemption is available to an employee on a fishing vessel who is engaged in first processing fish caught by fishing employees of that same fishing vessel; it would not be available to such an employee if some or all of the fish being first processed were obtained from other fishing vessels, regardless of the relationship, financial or otherwise, between such vessels (cf. *Mitchell v. Hunt*, 263 F.2d 913; *Farmers Reservoir Co. v. McComb*, 337 U.S. 755).

§ 784.133 The exempt operations.

The final requirement is that the employee on the fishing vessel must be employed in "the first processing, canning or packing" of the marine products. The meaning and scope of these operations when performed at sea as an incident to the fishing operations of the vessel are set forth in §§ 784.134 to 784.136. To be "employed in" such operations the employee must, as previously explained (see §§ 784.106 and 784.122), be engaged in work which is clearly part of the named activity.

§ 784.134 "First processing."

Processing connotes a change from the natural state of the marine product and first processing would constitute the first operation or series of continuous operations that effectuate this change. It appears that the first processing operations ordinarily performed on the fishing vessels at sea consist for the most part of eviscerating, removal of the gills, beheading certain fish that have large heads, and the removal of the scallop from its shell. Icing or freezing operations, which ordinarily immediately follow these operations, would also constitute an integral part of the first processing operations, as would such activities as filleting, cutting, scaling, or salting when performed as part of a continuous series of operations. Employment aboard the fishing vessel in freezing operations thus performed is within the exemption if the first processing of which it is a part otherwise meets the condi-

tions of section 13(a)(5), notwithstanding the transfer by the 1961 amendments of "freezing," as such, from this exemption to the exemption from overtime only provided by section 13(b)(4). Such preliminary operations as cleaning, washing and grading of the marine products, though not exempt as first processing since they effect no change, would be exempt as part of first processing when done in preparation for the first processing operation described above including freezing. The same would be true with respect to the removal of the waste products resulting from the above described operations on board the fishing vessel.

§ 784.135 "Canning."

The term "canning" was defined in the legislative history of the 1949 amendments (House (Conference) Report No. 1453, 81st Cong., 1st sess.; 95 Cong. Rec. 14878, 14932-33). These amendments made the "canning" of marine products or byproducts exempt from overtime only under a separate exemption (section 13(b)(4)), and subject to the minimum wage requirements of the Act (see § 784.137 et seq.). The same meaning will be accorded to "canning" in section 13(a)(5) as in section 13(b)(4) (see § 784.143 et seq.) subject, of course, to the limitations necessarily imposed by the context in which it is found. In other words, although certain operations as described in § 784.143 et seq. qualify as canning, they are, nevertheless, not exempt under section 13(a)(5) unless they are performed on marine products by employees of the fishing vessel at sea as an incident to, or in conjunction with, the fishing operations of the vessel.

§ 784.136 "Packing."

The packing of the various named marine products at sea as an incident to, or in conjunction with, the fishing operations of the vessel is an exempt operation. The term "packing" refers to the placing of the named product in containers, such as boxes, crates, bags and barrels. Activities such as washing, grading, sizing and placing layers of crushed ice in the containers are deemed a part of packing when performed as an integral part of the packing operation. The packing operation may be a simple or complex and an exempt operation depending upon the nature of the marine product, the length of time out and the facilities aboard the vessel. Where the fishing trip is of short duration, the packing operation may amount to no more than the simple operation of packing the product in chipped or crushed ice in wooden boxes, as in the case of shrimp, or placing the product in wooden boxes and covering with seaweed as in the case of lobsters. Where the trips are of long duration, as for several weeks or more, the packing operations on fishing vessels with the proper equipment sometimes are integrated with first processing operations so that together these operations amount to readying the product in a marketable form. For example, in the case of shrimp, the combined operations may consist of the following series of operations—washing, grading, sizing, placing

in 5-pound boxes already labeled for direct marketing, placing in trays with other boxes, loading into a quick freezer locker, removing after freezing, emptying the box, glazing the contents with a spray of fresh water, replacing in box, putting them in 50-pound master cartons and finally stowing in refrigerated locker.

GENERAL CHARACTER AND SCOPE OF THE SECTION 13(b) (4) EXEMPTION

§ 784.137 "Shore" activities exempted under section 13(b) (4).

Section 13(b) (4) provides an exemption from the overtime but not from the minimum wage provisions of the Act for "any employee employed in the canning, processing, marketing, freezing, curing, storing, packing for shipment, or distributing" aquatic forms of animal and vegetable life or any byproducts thereof. Originally, all these operations were contained in the exemption provided by section 13(a) (5) but, as a result of amendments, first "canning," in 1949, and then the other operations in 1951, were transferred to section 13(b) (4). (See the discussion in § 784.102 to 784.105.) These activities are "shore" activities and in general have to do with the movement of the perishable aquatic products to a nonperishable state or to points of consumption (S. Rep. 145, 87th Cong., 1st sess., p. 33).

§ 784.138 Relationship of exemption to exemption for "offshore" activities.

The reasons advanced for exemption of employment in "shore" operations, now listed in section 13(b) (4), at the time of the adoption of the original exemption in 1938, had to do with the difficulty of regulating hours of work of those whose operations, like those of fishermen, were stated to be governed by the time, size, availability and perishability of the catch, all of which were considered to be affected by natural factors that the employer could not control (see 83 Cong. Rec. 7408, 7422, 7443). The intended limited scope of the exemption in this respect was not changed by transfer of the "shore" activities from section 13(a) (5) to section 13(b) (4). The exemption of employment in these "shore" operations may be considered, therefore, as intended to implement and supplement the exemption for employment in "offshore" operations provided by section 13(a) (5), by exempting from the hours provisions of the Act employees employed in those "shore" activities which are necessarily somewhat affected by the same natural factors. These "shore" activities are affected primarily, however, by fluctuations in the supply of the product or by the necessity for consumption or preservation of such products before spoilage occurs (see *Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52; cf. *McComb v. Consolidated Fisheries*, 174 F. 2d 74).

§ 784.139 Perishable state of the aquatic product as affecting exemption.

(a) Activities performed after the conversion of an aquatic product to a nonperishable state cannot form the basis for application of the section 13(b) (4) exemption unless the subsequent opera-

tion is so integrated with the performance of exempt operations or aquatic forms of animal and vegetable life mentioned in the section that functionally and as a practical matter it must be considered a part of the operations for which exemption was intended. The exemption is, consequently, not available for the handling or shipping of nonperishable products by an employer except where done as a part of named operations commenced on the product when it was in a perishable state. Thus, employees of dealers in or distributors of such nonperishable products as fish oil and fish meal, or canned seafood, are not within the exemption. Similarly, there is no basis for application of the exemption to employees employed in further processing of or manufacturing operations on products previously rendered nonperishable, such as refining fish oil or handling fish meal in connection with the manufacture of feeds. Further specific examples of application of the foregoing principle are given in the subsequent discussion of particular operations named in section 13(b) (4).

(b) In applying the principle stated in paragraph (a) of this section, the Department has not asserted that the exemption is inapplicable to the performance of the operations described in section 13(b) (4) on frozen, smoked, salted, or cured fish. The Department will continue to follow this policy until further clarification from the courts.

§ 784.140 Scope of exempt operations in general.

Exemption under section 13(b) (4), like exemption under section 13(a) (5), depends upon the employment in the actual activities named in the section, and an employee performing a function which is not necessary to the actual conduct of a named activity, as explained in § 784.106, is not within the exemption. It is also essential to exemption that the operations named in section 13(b) (4) be performed on the forms of aquatic life specified in the section and not on other commodities or on mixed commodities a substantial part of which consist of materials or products other than the named aquatic products. Application of these principles has been considered generally in the earlier discussion, and further applications will be noted in the following sections and in the subsequent discussion of particular operations mentioned in the section 13(b) (4) exemption.

§ 784.141 Fabrication and handling of supplies for use in named operations.

(a) As noted in § 784.109, the exemption for employees employed "in" the named operations does not extend to an employee by reason of the fact that he engages in fabricating supplies for the named operations. Employment in connection with the furnishing of supplies for the processing or canning operations named in section 13(b) (4) is not exempt as employment "in" such named operations unless the functional relationship of the work to the actual conduct of the named operations is such that, as a practical matter, the employment is directly and necessarily a part of the op-

erations for which exemption is intended. Employees who meet the daily needs of the canning or processing operations by delivering from stock, handling, and working on supplies such as salt, condiments, cleaning supplies, containers, etc., which must be provided as needed if the named operations are to continue, are within the exemption because such work is, in practical effect, a part of the operations for which exemption is intended. On the other hand, the receiving, unloading, and storing of such supplies during seasons when the named operations are not being carried on, for subsequent use in the operations expected to be performed during the active season, are ordinarily too remote from the actual conduct of the named operations to come within the exemption (see § 784.113), and are not affected by the natural factors (§ 784.138) which were considered by the Congress to constitute a fundamental reason for providing the exemption. Whether the receiving, unloading, and storing of supplies during periods when the named operations are being carried on are functionally so related to the actual conduct of the operations as to be, in practical effect, a part of the named operations and within the exemption, will depend on all the facts and circumstances of the particular situation and the manner in which the named operations are carried on. Normally, where such activities are directed to building up stock for use at a relatively remote time and there is no direct integration with the actual conduct of the named operations, the exemption will not apply.

(b) It may be that employees are engaged in the same workweek in performing exempt and nonexempt work. For example, a shop machinist engaged in making a new part to be used in the repair of a machine currently used in canning operations would be doing exempt work. If he also in the same workweek makes parts to be used in a manufacturing plant operated by his employer, this work, since it does not directly or necessarily contribute to the conduct of the canning operations, would be non-exempt work causing the loss of the exemption if such work occupied a substantial amount (for enforcement purposes, more than 20 percent) of the employee's worktime in that workweek (see § 784.116 for a more detailed discussion).

§ 784.142 Examples of nonexempt employees.

An employer who engages in operations specified in section 13(b) (4) which he performs on the marine products and byproducts described in that section may operate a business which engages also in operations of a different character or one in which some of the activities carried on are not functionally necessary to the conduct of operations named in section 13(b) (4). In such a business there will ordinarily be, in addition to the employees employed in such named operations, other employees who are nonexempt because their work is concerned entirely or in substantial part with carrying on activities which constitute neither the actual engagement in the named operations nor the performance of functions

which are, as a practical matter, directly and necessarily a part of their employer's conduct of such named operations. Ordinarily, as indicated in § 784.160, such nonexempt employees will not be employed in an establishment which is exclusively devoted by the employer to the named operations during the period of their employment. It is usually when the named operations are not being carried on, or in places wholly or partly devoted to other operations, that employees of such an employer will be performing functions which are not so necessarily related to the conduct of the operations named in section 13(b) (4) as to come within the exemption. Typical illustrations of the occupations in which such nonexempt workers may be found (although employment in such an occupation does not necessarily mean that the worker is nonexempt) are the following: General office work (such as maintaining employment, social security, payroll and other records, handling general correspondence, etc., as distinguished from "marketing" or "distributing" work like that described in § 784.159), custodial, maintenance, watching and guarding occupations; furnishing food, lodging, transportation, or nursing services to workers; and laboratory occupations such as those concerned with development of new products. Such workers are, of course, not physically engaged in operations named in section 13(b) (4). In the ordinary case, and they are not exempt unless they can be shown to be "employed in" such operations on other grounds. But any of them may come within the exemption in a situation where the employer can show that the functions which they perform, in view of all the facts and circumstances and which the named operations are carried on, are actually so integrated with or essential to the conduct of the named operations as to be, in practical effect, directly and necessarily a part of the operations for which exemption was intended. Thus, for example, if canning operations described in section 13(b) (4) are carried on in a location where the canning employees cannot obtain necessary food unless the canner provides it, his employment of culinary employees to provide such food is functionally so necessary to the conduct of the canning operations that their work is, as a practical matter, a part of such operations, and the exemption will apply to them. On like principle, the exemption may apply to a watchman whose services are required during performance of the named operations in order to guard against spontaneous combustion of the products of such operations and other occurrences which may jeopardize the conduct of the operations.

"CANNING"

§ 784.143. Meaning and scope of "canning" as used in section 13(b) (4).

Section 13(b) (4) exempts any employee employed in the canning of aquatic forms of animal or vegetable life or byproducts thereof from the overtime requirements of the Act. As previously stated, it was made a limited exemption by the Fair Labor Standards Act Amend-

ments of 1949. The legislative history of this section in specifically explaining what types of activities are included in the term "canning" and the antecedents from which this section evolved make it clear that the exemption applies to those employees employed in the activities that Congress construed as being embraced in the term and not to all those engaged in the fish canning industry (Mitchell v. Stinson, 217 F. 2d 214). Congress defined the term "canning" (House Conference) Report No. 1453, 81st Cong., 1st sess., 95 Cong. Rec. 14878, 14932-33) as follows:

Under the conference agreement "canning" means hermetically sealing and sterilizing or pasteurizing and has reference to a process involving the performance of such operations. It also means other operations performed in connection therewith such as necessary preparatory operations performed on the products before they are placed in bottles, cans, or other containers to be hermetically sealed, as well as the actual placing of the commodities in such containers. Also included are subsequent operations such as the labeling of the cans or other containers and the placing of the sealed containers in cases or boxes whether such subsequent operations are performed as part of an uninterrupted or interrupted process. It does not include the placing of such products or byproducts thereof in cans or other containers that are not hermetically sealed as such an operation is "processing" as distinguished from "canning" and comes within the complete exemption contained in section 13(a) (5).

Of course, the processing other than canning referred to in the last sentence quoted above, is now, like canning, in section 13(b) (4) rather than section 13(a) (5).

§ 784.144. "Necessary preparatory operations."

All necessary preparatory work performed on the named aquatic products as an integral part of a single uninterrupted canning process is subject to section 13(b) (4) (see *Tobin v. Blue Channel Corp.*, 198 F. 2d 245, approved in *Mitchell v. Myrtle Grove Packing Co.*, 350 U.S. 891). Such activities conducted as essential and integrated steps in the continuous and uninterrupted process of canning are clearly within the definition of "canning" as contemplated by Congress and cannot be viewed in isolation from the canning process as a whole. Exempt preparatory operations include the necessary weighing, cleaning, picking, peeling, shucking, cutting, heating, cooling, steaming, mixing, cooking, carrying, conveying, and transferring to the containers the exempt aquatic products (see *Mitchell v. Stinson*, 217 F. 2d 214). But the preparatory operations do not include operations specified in section 13(a) (5) pertaining to the acquisition of the exempt products from nature. Therefore, if a canner employs fishermen or others to catch, take, harvest, cultivate, or farm aquatic animal and vegetable life, section 13(a) (5) and not section 13(b) (4) would apply to these particular operations.

§ 784.145. Preliminary processing by the canner.

The mere fact that operations preparatory to canning are physically sep-

arated from the main canning operations of hermetically sealing and sterilizing or pasteurizing would not be sufficient to remove them from the scope of section 13(b) (4). Where preparatory operations such as the steaming or shucking of oysters are performed in an establishment owned, operated, or controlled by a canner of seafood as part of a process consisting of a continuous series of operations in which such products are hermetically sealed in containers and sterilized or pasteurized, all employees who perform any part of such series of operations on any portion of such aquatic products for canning purposes are within the scope of the term "canning."

§ 784.146. Preliminary processing by another employer as part of "canning."

If the operations of separate processors are integrated in producing canned seafood products, all employees of such processors who perform any part of the described continuous series of operations to accomplish this result would be "employed in the canning of" such products. Moreover, preliminary operations performed in a separately owned processing establishment which are directed toward the particular requirements of a canner pursuant to some definite arrangement between the operators of the two establishments would generally appear to be integrated with the canner operations within the meaning of the above principles, so that the employees engaged in the preliminary operations in the separate establishment would be employed in "canning" within the meaning of section 13(b) (4) of the Act. Whether or not integration exists in a specific case of this general nature will depend, of course, upon all the relevant facts and circumstances in such case.

§ 784.147. Preservation of aquatic products for later canning.

The cooling, icing, or refrigeration of the aquatic products in the course of canning does not constitute such a break or discontinuance of the process as to bring the preparatory operations within other named operations in section 13(b) (4) instead of canning if the purpose of the refrigeration is to prevent spoilage for a short period, such as over the weekend, or during the transfer or shipment of the prepared products, or directly prior to the opening of the canning season. On the other hand, the freezing of aquatic products to be stored for a protracted or indefinite period for future canning is too remote from the actual canning to be considered as a part of that operation; it would, however, qualify as a "freezing" operation which is an exempt operation named in section 13(b) (4). This distinction is not without significance, for, as an exempt freezing operation, employees engaged therein are entitled to the minimum wage prescribed by section 6(b) of the Act for those to whom the minimum wage benefits are being extended for the first time as a result of the Fair Labor Standards Act amendments of 1961, rather than the minimum wage prescribed by section 6(a) of the Act for employees performing work which was

subject to the minimum wage prior to these amendments (§§ 784.23 to 784.25).

§ 784.148 Processing of aquatic products for canning and for other disposition.

Where canning and processing operations are intermingled, the former and not the latter exemption applies (see *Mitchell v. Myrtle Grove Packing Company*, 350 U.S. 891; *Tobin v. Blue Channel Corporation*, 198 F. 2d 245). Thus, where preparatory operations are performed on fish or seafood, some of which are to be canned and some of which are for processing, all the necessary preparatory operations are exempt as part of canning until that point in the operations where the commodity is channeled to accomplish the separate objectives, namely, canning or processing. Thereafter, the canning operations would be exempt as canning and the processing operations would be exempt as processing. For example, all the preparatory activities in a roe canning plant such as any unloading of the fish, cutting off the heads and tails, cleaning and scaling leading up to and including the extraction of the roe would qualify as canning operations, whereas the subsequent boning and filleting of the fish would come within processing operations when none of the filleted fish is to be canned. The minimum rates applicable in such a situation would be determined in accordance with the principles stated in §§ 784.23 to 784.25 of Subpart A of this Part 784.

§ 784.149 "Hermetically sealing and sterilizing or pasteurizing."

As previously indicated in § 784.143, hermetically sealing and sterilizing or pasteurizing are the operations which characterize the process of canning. Employment in such operations is clearly within the section 13(b) (4) exemption. Employees whose work does not relate to a process which includes these operations are not employed in canning. A process involving the placing of the aquatic products in cans or containers without hermetically sealing and sterilizing or pasteurizing is not canning, within the meaning of the exemption. Depending on the operations involved it may be "processing" or "packing for shipment" within the scope of the exemption, in which event the pay provisions for "new" rather than those for "old" coverage will be applicable, as explained in §§ 784.23 to 784.25, in Subpart A of this Part 784.

§ 784.150 "Subsequent operations."

Canning, within the meaning of the exemption, includes operations performed after hermetic sealing of the cans or other containers, such as labeling of them and placing of them in cases or boxes, which are required to place the canned product in the form in which it will be sold or shipped by the canner. This is so whether or not such operations immediately follow the actual canning operations as a part of an uninterrupted process. Storing and shipping operations performed by the employees of the cannery in connection with its canned products, during weeks in which canning operations are going on, to make room

for the canned products coming off the line or to make storage room come within the exemption as a part of canning. The fact that such activities relate in part to products canned during previous weeks or seasons would not affect the application of the exemption, provided canning operations such as hermetic sealing and sterilizing, or labeling, are currently being carried on. When, however, operations with respect to the aquatic products processed by the employer are performed as a part of his activities in "marketing," "storing," "packing for shipment," or "distributing" such products rather than as a part of canning as above described (cf. *Calaf v. Gonzalez*, 127 F. 2d 934; *Tobin v. Blue Channel Corp.*, 198 F. 2d 245; *Mitchell v. Myrtle Grove Packing Co.*, 350 U.S. 891), these operations, while also exempt under section 13(b) (4), are subject to the minimum wage provisions of section 6 (b) rather than section 6(a) of the Act and, if intermingled with those which are part of canning, will be subject to the rules stated previously in §§ 784.23 to 784.25, in Subpart A of this Part 784.

§ 784.151 Employees "employed in" canning.

All employees whose activities are directly and necessarily a part of the "canning" of the specified aquatic forms of life are within the exemption provided by section 13(b) (4). Thus, employees engaged in handling the fish or seafood, placing it into the cans, providing steam for cooking it, or operating the machinery that seals the cans or the equipment that sterilizes the canned product are engaged in exempt activities. In addition, can loft workers, those engaged in removing and carrying supplies from the stock room for current use in canning operations, and employees whose duty it is to reform cans, when canning operations are going on, for current use, are engaged in exempt activities. Similarly, the repainting, oiling, or greasing during the active season of canning machinery or equipment currently used in the actual canning operations are exempt activities. The making of repairs in the production room such as to the floor around the canning machinery or equipment would also be deemed exempt activities where the repairs are essential to the continued canning operations or to prevent interruptions in the canning operations. These examples are illustrative but not exhaustive. Employees engaged in other activities which are similarly integrated with and necessary to the actual conduct of the canning operations will also come within the exemption. Employees whose work is not directly and necessarily a part of the canning operations are not exempt. See §§ 784.106, 784.141, and 784.142.

PROCESSING, FREEZING, AND CURING

§ 784.152 General scope of processing, freezing, and curing activities.

Processing, freezing, and curing embrace a variety of operations that change the form of the "aquatic forms of animal and vegetable life." They include such operations as filleting, cutting, scaling, salting, smoking, drying, pickling, cur-

ing, freezing, extracting oil, manufacturing meal or fertilizer, drying seaweed preparatory to the manufacture of agar, drying and cleaning sponges (*Fleming v. Hawkeye Pearl Button Co.*, 113 F. 2d 52).

§ 784.153 Typical operations that may qualify for exemption.

Such operations as transporting the specified aquatic products to the processing plant; moving the products from place to place in the plant; cutting, trimming, eviscerating, peeling, shelling and otherwise working on the products; packing the products; and moving the products from the production line to storage or to the shipping platform are typical of the operations in processing plants which are included in the exemption. Removal of waste, such as clam and oyster shells, operation of processing and packing machinery, and providing steam and brine for the processing operations (see *Mitchell v. Trade Wind, Inc.*, 289 F. 2d 278, explaining *Waller v. Humphreys*, 133 F. 2d 193) are also included. As for the application of the exemption to office, maintenance, warehouse, and other employees, see the discussion in § 784.106 et seq., and §§ 784.141 and 784.142.

§ 784.154 Named operations performed on previously processed aquatic products.

It will be noted that section 13(b) (4) refers to employees employed in "processing" the named aquatic commodities and not just to "first processing" as does the provision in section 13(a) (5) for such processing at sea. Accordingly, if the aquatic products, though subjected to a processing operation, are still in a perishable state, the subsequent performance of any of the enumerated operations on the still perishable products will be within the exemption no matter who the employer performing the exempt operations may be. He may be the same employer who performed the prior processing or other exempt operations, another processor, or a wholesaler, as the case may be. As noted in § 784.139(b), the Department has not questioned the applicability of the foregoing rule where the operation is performed on frozen, salted, smoked, or cured fish.

§ 784.155 Operations performed after product is rendered nonperishable.

As indicated in § 784.139, after the character of the aquatic products as taken from nature has been altered by the performance of the enumerated operations so as to render them nonperishable (e.g., drying and cleaning sponges) section 13(b) (4) provides no exemption for any subsequent operations on the preserved products, unless the subsequent operation is performed as an integrated part of the operations named in the exemption which are performed by an employer on aquatic commodities described in section 13(b) (4) after receiving them in the perishable state. In the case of an employer who is engaged in performing on perishable aquatic forms of life specified in section 13(b) (4) any operations named in that section which result in a nonperishable product, the employment of his employees in the storing, marketing, packing for shipment, or

distributing of nonperishable products resulting from such operations performed by him (including products processed during previous weeks or seasons) will be considered to be an integrated part of his operations on the perishable aquatic forms of life during those workweeks when he is actively engaged in such operations. The employees employed by him in such work on the nonperishable products are, accordingly, within the exemption in such workweeks.

§ 784.156 Operations performed on byproducts.

The principles stated in the two preceding sections would also be applicable where the specified operations are performed on perishable byproducts. Any operation performed on perishable fish scraps, an unsegregated portion of which is to be canned, would come within the canning (not the processing) part of the exemption (see § 784.148). Fish-reduction operations performed on the inedible and still perishable portions of fish resulting from processing or canning operations, to produce fish oil or meal, would come within the processing part of the exemption. Subsequent operations on the oil to fortify it would not be exempt, however, since fish oil is nonperishable in the sense that it may be held for a substantial period of time without deterioration.

MARKETING, STORING, PACKING FOR SHIPMENT, AND DISTRIBUTING

§ 784.157 General scope of named operations.

The exemption from the overtime pay requirements provided by section 13(b) (4) of the Act extends to employees "employed in the * * * marketing * * * storing, packing for shipment, or distributing of any kind of" perishable aquatic product named in the section. An employee's work must be functionally so related to the named activity as to be, in practical effect, a part of it, and the named activity must be performed with respect to the perishable aquatic commodities listed in section 13(b) (4). In order for the exemption to apply to him. The named activities include the operations customarily performed in the marketing, storing, packing for shipment, or distributing of perishable marine products. For example, an employee engaged in placing perishable marine products in boxes, cartons, crates, bags, barrels, etc., preparatory to shipment and placing the loaded containers on conveyances for delivery to customers would be employed in the "packing for shipment" of such products. Salesmen taking orders for the perishable aquatic products named in the section would be employed in the "marketing" of them. Employees of a refrigerated warehouse who perform only duties involved in placing such perishable marine products in the refrigerated space, removing them from it, and operating the refrigerating equipment, would be employed in "storing" or "distributing" such products, depending on the facts. On the other hand, employees of a public warehouse handling aquatic products which have been canned or otherwise

rendered nonperishable, or handling perishable products which contain a substantial amount of ingredients not named in section 13(b) (4), would not be within the exemption. Office, clerical, maintenance, and custodial employees are not exempt by reason of the fact that they are employed by employers engaged in marketing, storing, packing for shipment, or distributing seafood and other aquatic products. Such employees are exempt only when the facts of their employment establish that they are performing functions so necessary to the actual conduct of such operations by the employer that, as a practical matter, their employment is directly and necessarily a part of the operations intended to be exempted (see, for some examples, § 784.159).

§ 784.158 Relationship to other operations as affecting exemption.

Employment in marketing, storing, distributing, and packing for shipment of the aquatic commodities described in section 13(b) (4) is, as such, exempted from the overtime pay provisions of the Act. This means that the employees actually employed in such operations on the named commodities are within the exemption without regard to the intimacy or remoteness of the relationship between their work and processing operations also performed on the commodities, so long as any prior processing has not rendered the commodity nonperishable (as in the case of a canned product) and therefore removed it from the category of marine products referred to by section 13(b) (4). If the commodity has previously been rendered nonperishable, the marketing, storing, distributing, or packing for shipment of it by an employee can come within the exemption only if the activity is one performed by his employer as an integrated part of a series of the named operations which commenced with operations on the perishable marine products to which section 13(b) (4) refers. Some examples of this situation are given in §§ 784.150 and 784.155.

§ 784.159 Activities performed in wholesale establishments.

The section 13(b) (4) exemption for employment in "marketing * * * storing, or distributing" the named aquatic products or byproducts, as applied to the wholesaling of fish and seafood, affords exemption to such activities as unloading the aquatic product at the establishment, icing or refrigerating the product and storing it, placing the product into boxes, and loading the boxes on trucks or other transportation facilities for shipment to retailers or other receivers. Transportation to and from the establishment is also included (Johnson v. Johnson & Company, Inc., N.D. Ga., 47 F. Supp. 850). Office and clerical employees of a wholesaler who perform general office work such as posting to ledgers, sending bills and statements, preparing tax returns, and making up payrolls are not exempt unless these activities can be shown to be functionally necessary, in the particular fact situation, to the actual conduct of the operations named in section 13(b) (4). Such activities as selling, taking and putting up orders, recording sales, and taking

cash are, however, included in employment in "marketing" or "distributing" within the exemption. Employees of a wholesaler engaged in the performance of any of the enumerated operations on fresh fish or fish products will be engaged in exempt work. However, any such operations which they perform on aquatic products which have been canned or otherwise rendered nonperishable are nonexempt in accordance with the principles stated in §§ 784.139 and 784.158.

APPLICATION OF SECTION 13(b) (4) IN CERTAIN ESTABLISHMENTS

§ 784.160 Establishments exclusively devoted to named operations.

As noted in § 784.106 and elsewhere in the previous discussion, the section 13(b) (4) exemption depends on employment of the employee in the operations named in that section and does not apply on an establishment basis. However, the fact that an establishment is exclusively devoted to operations specified in section 13(b) (4) is, in the absence of evidence to the contrary, an indication that the employees employed there are employed in the named operations either directly or through the performance of functions so necessary to conducting the operations that the employment should in practical effect, be considered a part of the activity intended to be exempted. Where this is the case, it is consistent with the legislative intent to avoid segmentation and treat all employees of the establishment in the same manner (see Sen. Rep. No. 145, 87th Cong. 1st sess., p. 33). Accordingly, where it can be demonstrated that an establishment is, during a particular workweek, devoted exclusively to the performance of the operations named in section 13(b) (4), on the forms of aquatic life there specified, any employee of the establishment who is employed there during such workweek will be considered to be employed in such operations and to come within the exemption if there are no other facts pertinent to his employment that require a particular examination of the functions which he performs in connection with the conduct of the named operations. If, however, there are any facts (for example, the employment of the same employee at the establishment or the engagement by other employees in like duties there during periods when none of the named operations are being carried on) which raise questions as to whether he is actually engaged in the exempt activities, it will be necessary to scrutinize what he is actually doing during the conduct of the operations named in section 13(b) (4) in order to determine the applicability of the exemption to him. This is necessary because an employee who would not otherwise be within the exemption, such as a carpenter doing repair work during the dead season, does not become exempt as "employed in" one of the named activities merely because the establishment begins canning or processing fish.

Signed at Washington, D.C., this 2d day of February 1962.

CLARENCE T. LUNDQUIST,
Administrator.



Treasury Department

BUREAU OF CUSTOMS

GROUND FISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1962:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1962 is 28,571,433 pounds, the Bureau of Customs announced in the February 10, 1961, Federal Register. Divided into quarterly quotas this means that 7,142,858 pounds of groundfish fillets and steaks during each quarter of 1962 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound. As of February 2, the U. S. Bureau of Customs reported that the first quarter 1962 quota of 7,142,858 at the 1-7/8-cents rate had been filled.

The reduced-rate import quota for 1962 is 12.4 percent less than the 1961 quota of 32,600,645 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." A further decline took place in 1962. In fact, the 1962 quota (the lowest since 1950) is 2.5 percent less than in 1951.

Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets, 1952-1962	
Year	Quota 1,000 Lbs.
1962	28,571
1961	32,601
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950
1953	33,866
1952	31,472

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1959-61) preceding 1962 was only 190,476,220 pounds, calculated in accordance with the proviso to item 717(b) of Part 1, Schedule XX, of the General Agreement on Tariff and Trade (T. D. 51802). This was less than the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

A decision by the United States Customs Court in 1959 held that fish blocks imported in bulk are dutiable at one cent a pound under Tariff paragraph 720(b). Prior to that decision, fish blocks were classified under paragraph 717(b), the same as fish fillets. The change became effective September 15, 1959, and fish blocks imported in bulk since that date have been classified under paragraph 720(b). Therefore, fish blocks imported since the effective date have not entered in the calculation of apparent annual consumption or the quota since only imports under 717(b) are considered in the calculation. In view of this, it is estimated that if fish blocks had remained under the 717(b) classification, apparent annual consumption for 1959-61 would have been greater than that for the previous three-year period, and also the quota for 1962 would have been greater than that for 1960 and 1961.

Note: See Commercial Fisheries Review, March 1961 p. 93.



Eighty-Seventh Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Intro-



duction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: Introduced in House: Jan. 25, 1962, H.R. 9903 (Walter), to amend certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; Jan. 31, H.R. 10021 (Walter), Feb. 7: H.R. 10057 (King), H.R. 10076 (Wharton), H.R. 10081 (Dent), and Feb. 8, H.R. 10118 (Daniel); all to the Committee on Ways and Means.

COMMERCE COMMITTEE INVESTIGATIONS IN SENATE: Investigations by the Senate Committee on Commerce, Senate Report No. 1158, Jan. 31, 1962, 10 pp., printed. Report establishes committee responsibilities, including fisheries and wildlife and marine sciences. The report delineates in broad terms the problems which confront the committee during this session of Congress. Under the Merchant Marine and Fisheries Subcommittee, the report points out: "Sports fishing and hunting continue to grow in popularity and millions of American families take advantage of these outdoor recreational pastimes--50 million Americans over 12 years of age went hunting or fishing or both in 1960. They spend over \$4 billion and our businessmen and manufacturers are devoting a greater amount of effort to satisfy family needs in this recreational field. We will consider legislation to promote effectual planning, development, maintenance, and coordination of this natural resource.

"Our commercial fishery has problems. There are legislative proposals to step up fisheries research, to encourage the development of new fish products, to study the depredations of destructive predators, and to do what we can, in a legislative way, to aid and assist our state officials in conservation practices.

"In 1959 alien fleets moved into waters adjacent to Alaska. We must determine how we are to cope with this international threat to a common resource. For the committee's consideration are bills to improve and modernize our fishing fleets in order to meet our foreign competition. We must not permit the depletion of our natural resources.

"The protection of marine mammals, research and studies on effects of insecticides upon our wildlife, the preservation of bird species, and many and varied problems relating to game animals, wild fowl, and bird life demand our attention."

Under special subcommittees and studies, the report has this to say about marine sciences: "Oceanography has, and will continue to take a great deal of our time and energy. Two of our members attended the first session of the Intergovernmental Oceanographic Commission held in Paris last October. Thirty-nine nations participated. We must carefully watch the expanding oceanographic programs of other nations. We must maintain close contact with the National Academy of Sciences Committee on Oceanography, the Coordinating Committee on Oceanography, comprised of the ranking professional oceanographers of all Government agencies, with institutions and laboratories engaged in oceanographic or Great Lakes research, and with industries which recently have established laboratories for sophisticated marine studies, encouraged by the deep interest manifest by our committee and the Congress."

"The emergence of Soviet Russia as the most active of all nations in worldwide deepwater studies; the numerous resolutions adopted by the IOC at Paris relating to international ocean surveys, expeditions, communications, and weather observations; the recommendations of U. S. scientific bodies, including NASCO, and of Government departments and agencies, all present important problems within the province of this committee, many of which may require constructive legislation as well as constant vigilance."

The committee report also commented on its responsibilities as to foreign commerce, and packaging and labeling.

FEDERAL AID IN FISH RESTORATION: The Senate and House received on Feb. 19, 1962, a letter from the Secretary of the Interior, transmitting, pursuant to law, a report on activities of the Federal aid in fish restoration program, for the year ended June 30, 1961 (with an accompanying report); to the Committee on Commerce.

FISH AND WILDLIFE LEGISLATION: House Committee on Merchant Marine and Fisheries; Subcommittee on Fisheries and Wildlife Conservation on Feb. 6 and 7, 1962, held hearings on the following: H.R. 7336, to make loans to certain producers of oysters; H.R. 6529, to provide for the establishment of a new fish hatchery in the eastern part of the State of Tennessee; H.R. 8371, to construct, equip, operate, and maintain a fish hatchery in DeKalb County, Tenn.; and H.R. 2722, and identical bills, to establish a research program in order to determine means of improving the conservation of game and food fish in dam reservoirs. Heard testimony from three Congressmen on all the above bills; Department of the Interior officials reported on H.R. 7336.

FISH PROTEIN CONCENTRATE: Senator Douglas in the Senate on Feb. 6, 1962, made a statement on the U. S. Food and Drug Administration position on disapproving the sale of a fish protein concentrate made from whole fish. The statement by Senator Douglas, which appeared in the Congressional Record of Feb. 6, 1962 (p. 1664), describes fish protein concentrate or fish flour; how it is made; support of certain U. S. agencies; the Food and Drug Administration's disapproval of such a product made from whole fish; sale of other food items, and in conclusion states:

"Fish protein concentrate is important because it can help solve hunger and undernourishment in the world. People in many countries are undernourished and either cannot afford or do not have access to foods which contain sufficient proteins for their families. If we could ship fish protein concentrate to them, it could be added to their meager diets and they would thus receive the protein necessary for healthy lives."

"The low cost of the product makes it an ideal item in such programs as food for peace, United Nations food programs, and other projects designed to reduce hunger in the world. It is important because it also can be used in our own country to increase the food standards of many families at a very low cost."

"Under the restrictions by the Food and Drug Administration, the cost of this product would be so increased that those people who most need it could not afford it. The food is safe, it is pure, it is cheap, it is the best product we can offer to reduce hunger and increase world health."

Senator Proxmire endorsed Senator Douglas' statement and said in part: "... I recognize the very great value in using it, as the Senator has said, with rice and with bread. It is a marvelous product. It will make available to starving people all over the world food of very high nutritious value at a very low cost. . . ."

In the Senate on Feb. 8, 1962, Senator Gruening spoke on fish protein concentrate or fish flour and the Food and Drug Administration proposed standard of identity, which does not provide for manufacture of the concentrate from whole fish. He stated he had written to the Secretary of Health, Education and Welfare "protesting this proposed standard and requesting an objective hearing before a hearing examiner having no connection with that Department." The Senator's letter to the Secretary of Health, Education and Welfare was published in the Congressional Record of Feb. 8, 1962 (p. 1915).

Senator Smith on Feb. 19, 1962, presented to the Senate a preliminary report on a study on manufacturing methods of fish protein, also known as fish flour. The study, being made with a \$50,000 grant given by Congress, is being conducted by Dr. E. R. Pariser of the U. S. Bureau of Commercial Fisheries.

Senator Smith pointed out that the Food and Drug Administration proposed standard of identity for fish protein makes the product expensive and lowers the nutritional value. In a letter of protest to the Secretary of Health, Education and Welfare he has asked for a proper hearing before an impartial examiner.

Dr. Pariser, in his report (which appears in the Congressional Record Feb. 19, 1962, pp. 2215-2218), stated that the over-all program set up for the 5-year research project will consist of 3 phases: (1) survey of processing methods, (2) assembly of a consulting group, and (3) laboratory developments.

The accomplishment thus far has been the completion of the first phase of the project. Plants in the United States, Canada, Central and South America were visited. The following observations were made: (1) in the United States considerable efforts have been made by a number of private industrial concerns. (2) In Canada studies are being conducted by the Technologi-

cal Station of the Canadian Fisheries Research Board in Halifax. Their program is directed toward the production of the best fish protein concentrate. (3) In South and Central America there is a most urgent need for a cheap nutritious protein supplement, suitable raw materials are available, no satisfactory process to manufacture fish protein concentrate exists, and interest in fish protein concentrate is alive in those countries.

Dr. Pariser, in conclusion, stated that once the large-scale extraction of proteins from the seas is successfully achieved it would be the beginning of a new fishing industry; it will develop as the population grows; it will rank foremost in importance with but a few other industries, capable of producing a cheap, high-quality food, available to everyone, everywhere.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: H.R. 10269 (Reuss) introduced in the House Feb. 19, 1962, to the Committee on Public Works, Would amend title 23 of the United States Code relating to highways in order to require the approval of the Secretary of the Interior to surveys, plans, specifications, and estimates for projects on the Federal-aid highway systems for the purpose of protecting fish and wildlife and recreation resources.

NORTH PACIFIC AND BERING SEA FISHERIES: On Feb. 15, 1962, the Senate received a resolution of the Senate of the State of Alaska (Alaska Senate Resolution 34) relating to the initiation of Federal studies and programs regarding the condition and exploitation of the North Pacific and Bering Sea Fisheries, referred to the Committee on Commerce. The resolution urges the Federal Government to take immediate steps to initiate projects for offshore fish and shellfish studies and the necessary oceanographic, processing, transportation, and marketing research essential to the proper implementation of the Nation's right to the beneficial exploitation of this natural resource in international waters.

NORTHWEST ATLANTIC FISHERIES CONVENTION: The Senate Committee on Foreign Relations, on Jan. 23, 1962, in open session, received testimony from Deputy Special Assistant for Fish and Wildlife, Department of State, on Ex. M (87th Cong., 1st Session) International Convention for Northwest Atlantic Fisheries (Mollusks). The Committee on the same day approved and reported to the Senate this amendment to the Convention.

The Senate, on Jan. 31, 1962, ratified the amendment. This amendment to the Convention provides for giving the Commission authority over mollusks, which were not included under the original Convention. Provides that the words "fish," "fishes," "fishery," "fisheries," and "fishing" as they appear in the original Convention include and apply to mollusks as well as finfish. This does not require House action.

OCEANOGRAPHIC RESEARCH PROGRAM: The Committee on Merchant Marine and Fisheries: Subcommittee on Oceanography met in executive session Jan. 24, 1962, on H.R. 4276, to expand and develop the aquatic resources of the United States; and S. 901, to advance the marine sciences and to establish a comprehensive 10-year program of oceanographic research. No final action was taken, and the subcommittee adjourned subject to call of the Chair.

RESEARCH: Federal Budgeting for Research and Development (Hearing before the Subcommittee on

Reorganization and International Organizations of the Committee on Government Operations, United States Senate, 87th Congress, 1st Session, Agency Coordination Study Pursuant to S. Res. 26, 87th Cong., July 26 and 27, 1961, Part II, 444 pp., printed. It contains information from a Government-wide standpoint on problems of Federal budgeting for research and development, correspondence with Federal departments and agencies as regards problems unique to their particular research and development budgets, charts prepared by the subcommittee staff as part of the extensive review of Government scientific activities, and excerpts from other materials that have bearing upon Federal budgeting for research and development. One section deals directly with the U. S. Fish and Wildlife Service and presents information on the research and development programs of the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife.

SCIENCE DEPARTMENT: S. 2771 (McClellan and others) introduced in Senate Jan. 31, 1962, to the Committee on Government Operations; for the establishment of a Commission on Science and Technology. Similar to other bills except that this bill would establish a commission whereas the others would establish a department. Would set up a Science Advisory Panel and special task forces to evaluate all Federal scientific and technological activities and related private industrial and institutional activities. Objective is for a joint legislative and executive study of Federal scientific and technical activities in order to evaluate the organization and administration of such activities and to recommend improvements in present operations, including minimizing duplication of effort, and effecting necessary reorganization.

SHELLFISH PROCESSING EXEMPTION FROM MINIMUM WAGE: Special Subcommittee on Labor of the House Committee of Education and Labor is scheduled to meet Feb. 16, 1962, on shellfish processing exemption from minimum wage.

SUBMERGED LANDS ACT: H.R. 10042 (Waggonner), introduced in House Feb. 1, 1962, to the Committee on the Judiciary, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within said boundaries. Similar to other bills in the House and Senate during the first session of the 87th Congress.

TRADE EXPANSION ACT: Both House and Senate received message from the President (H. Doc. 314) on Jan. 25, 1962, on the Reciprocal Trade Agreements Program. Message indicated that the President was transmitting to Congress a new and modern instrument of trade negotiations--the Trade Expansion Act of 1962.

The President asked Congress for authority to "pool our resources and resourcefulness in an open trade partnership with Western Europe." He asked for broad authority to cut all tariffs up to 50 percent and to eliminate completely tariffs on products in which European-American trade amounts to 80 percent of the world total. Reductions would be spaced over the next decade. All trade concessions to the European market would be available to other free world associates, mainly Latin America and Japan. In return, the President hopes he can persuade the swiftly developing European Common Market to open up to American competition in return. The President said: "Let me emphasize that we mean

to see to it that all reductions and concessions are reciprocal--and that the access we gain is not limited by the use of quotas or other restrictive devices." The President minimized the adverse effects of increasing imports and emphasized the potential benefits from expanding exports. "Several hundred times as many workers owe their jobs directly or indirectly to exports," the President said, "as are in the small group--estimated to be less than one-half of 1 percent of all workers--who might be adversely affected by a sharp increase in imports."

The President indicated certain safeguards against injury to American industry. Escape clause relief would continue to be available with more up-to-date definitions. Temporary tariff relief will be granted where essential. And the four basic stages of the traditional peril point procedures and safeguards will be retained and improved.

Government should stand ready to aid farm and factory workers and companies temporarily hurt. He proposed these as "effective and relatively inexpensive" measures. For workers left idle--financial help for job retraining and relocation, along with Federal "readjustment allowances" for up to a full year at 65 percent of average weekly pay, plus an additional 13 weeks for those over 60. For business firms and farmers--Federal loans and loan guarantees, technical guidance, and "tax benefits" to help companies modernize plants and diversify products.

The President stated, "This cannot be and will not be a subsidy program of government paternalism. It is instead a program to afford time for American initiative, American adaptability, and American resiliency to assert themselves. It is consistent with that part of the proposed law which would stage tariff reductions over a 5-year period. Accordingly, trade adjustment assistance, like the other provisions of the Trade Expansion Act of 1962, is designed to strengthen the efficiency of our economy, not to protect inefficiencies. Authority to grant temporary tariff relief will remain available to assist those industries injured by a sudden influx of goods under revised tariffs. But the accent is on adjustment more than assistance. Through trade adjustment prompt and effective help can be given to those suffering genuine hardship in adjusting to import competition, moving men and resources out of un-economic production into efficient production and competitive positions, and in the process preserving the employment relationships between firms and workers wherever possible. Unlike tariff relief, this assistance can be tailored to their individual needs without disrupting other policies. . . ."

H.R. 9900 (Mills) introduced in House Jan. 25, 1962, to the Committee on Ways and Means; to promote the general welfare, foreign policy, and security of the

United States through international trade agreements and through adjustment assistance to domestic industry, agriculture, and labor, and for other purposes. This would implement the Administration's new trade policy and would be known as the Trade Expansion Act of 1962.

S. 2840 (Javits) introduced in Senate Feb. 15, 1962, to the Committee on Finance; to provide authority for the President, under the control and direction of the Congress, to make such necessary adjustments in the trade policies of the United States as may be necessary to meet the complex and rapidly changing economic and political conditions prevailing in the world, and to provide the means for assisting domestic enterprises, communities, and individuals to adjust their productive activities to change economic conditions resulting from the increased participation of the United States in world trade. Title of bill, "Trade Policy Act of 1962." Senator Javits in introducing the bill pointed out that it is an alternative to the President's program (H.R. 9900). The approach of the bill is that: (1) the new trade policy must be confined to the item-by-item or commodity concept of world trade; (2) Congress must participate in the broad direction of foreign trade policy and must be able to make its will effective; (3) would provide for congressional policy directions in the utilization of Presidential negotiating authority and for congressional veto power over the most important phases of the exercise of Presidential authority; (a) trade agreements, (b) national security proclamations, (c) escape clause actions, and (d) adjustment assistance administration. The Senator stated that the reason for introducing this alternative legislation is that the United States must take the leadership in forging a unified free world trading policy toward the Soviet bloc.

Foreign Economic Policy for the 1960's: Report of the Joint Economic Committee to the Congress of the United States with Minority and Other Views, 57 pp., printed, 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 20 cents a copy.) Contains a discussion of the United States trade policy, trade relations with third countries, East-West trade, objections of foreign policy in the 1960's, the need for a new kind of bargaining authority, safeguards and trade policy, and our economic policies. Also contains statements from several Senators.

VESSEL SUPPLIES EXEMPT FROM DUTIES: S. 2674 (Curtis), introduced in Senate Jan. 15, 1962, a bill to amend section 309 (a) (1) (B) of the Tariff Act of 1930, as amended, to the Committee on Finance. Proposes to exempt, from duties and internal revenue taxes, supplies (not including equipment) for vessels of the United States engaged in coastwise trade. This exemption applies to vessels engaged in fisheries.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

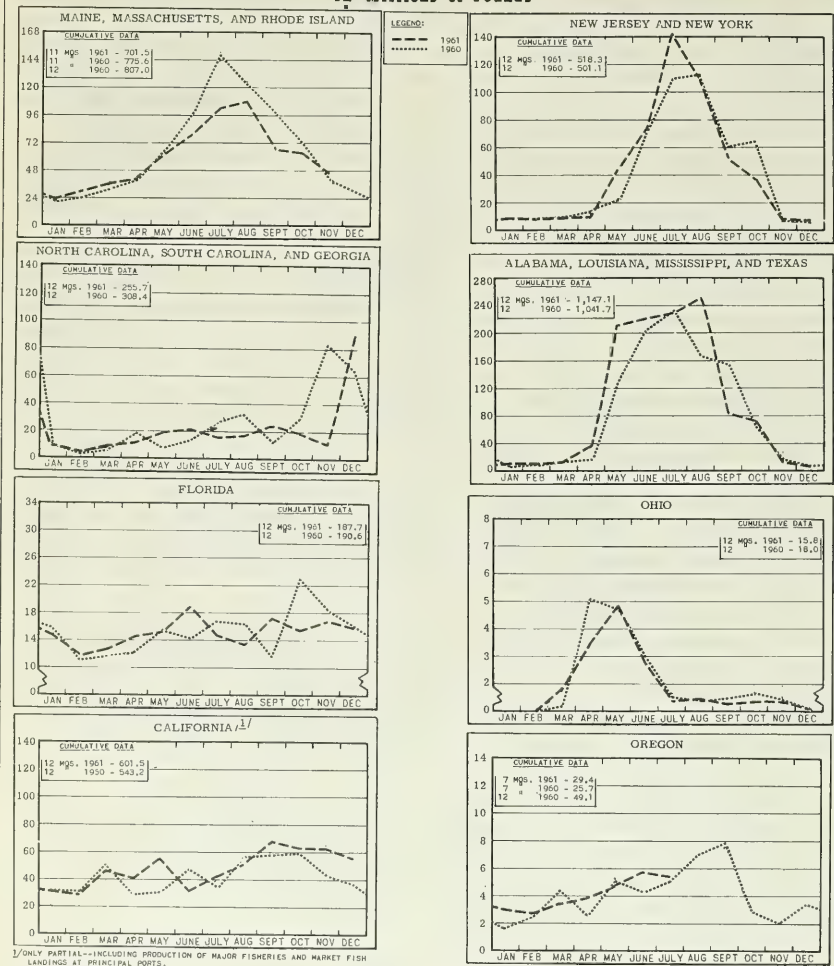
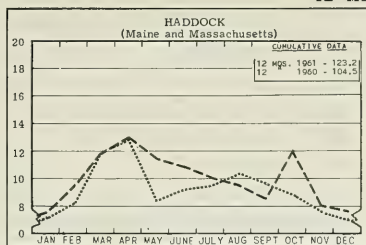
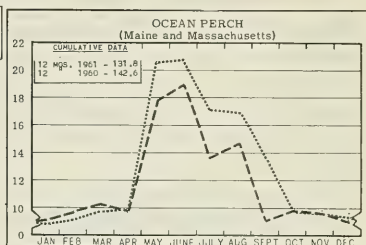


CHART 2 - LANDINGS for SELECTED FISHERIES

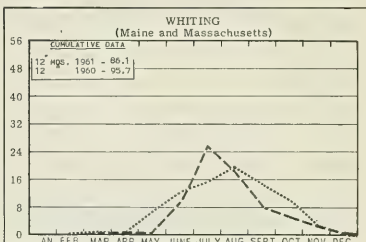
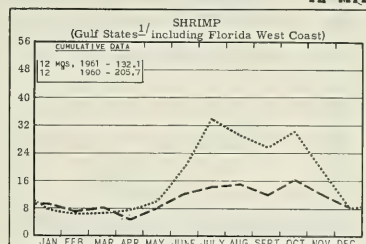
In Millions of Pounds



LEGEND:
1961
1960

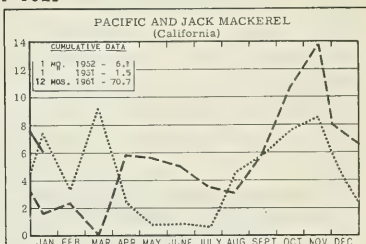
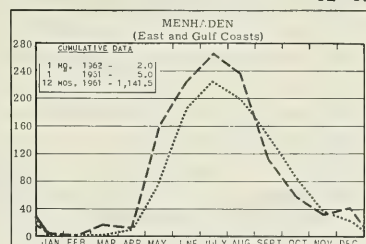


In Millions of Pounds



^{1/2}A. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

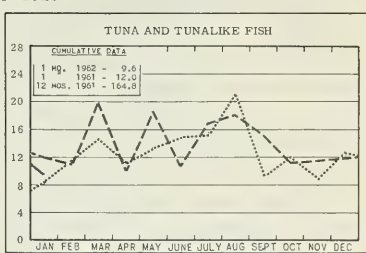
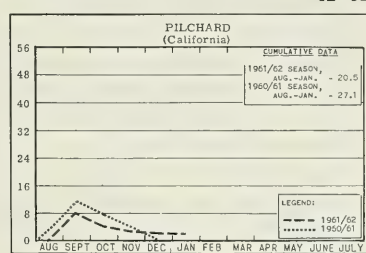
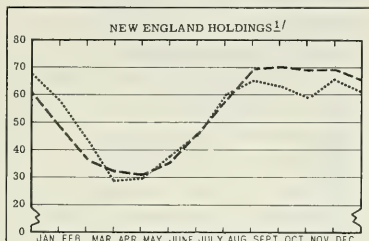
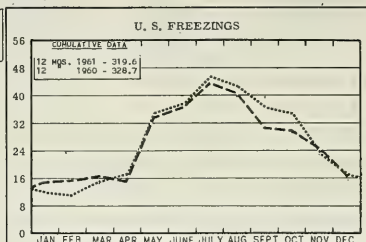
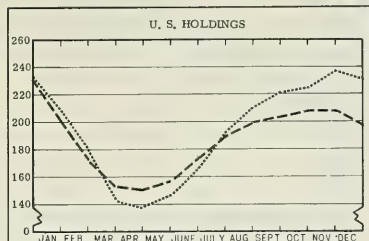
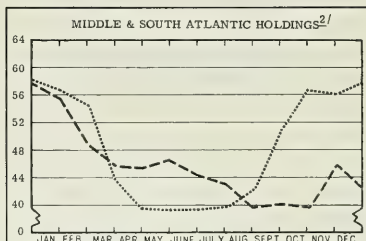


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

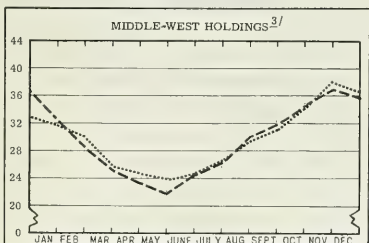
In Millions of Pounds



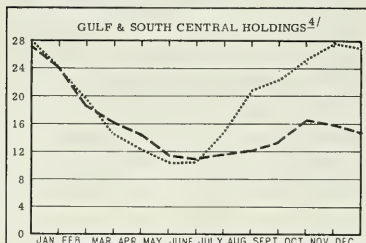
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



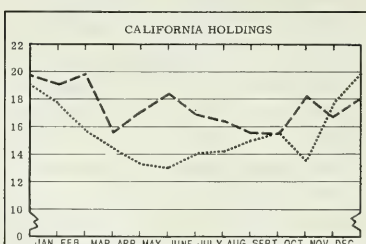
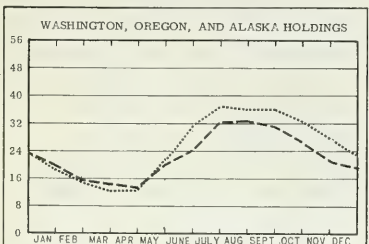
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



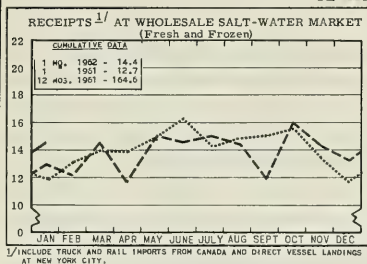
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



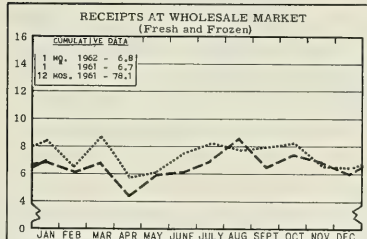
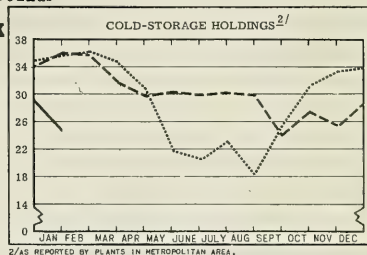
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

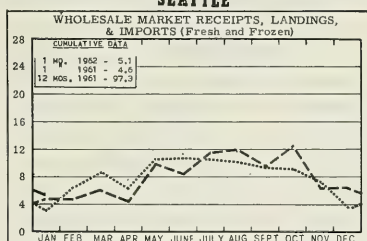
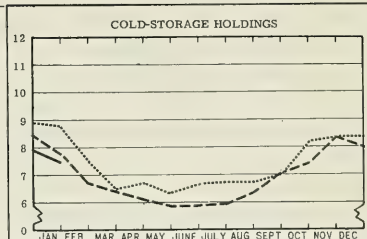
In Millions of Pounds



NEW YORK CITY

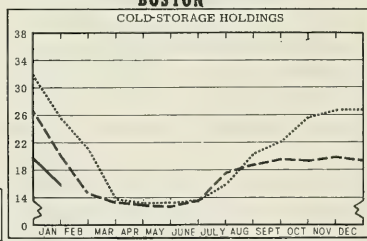


CHICAGO



SEATTLE

LEGEND:
 — 1962
 - - 1961
 1960



BOSTON

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

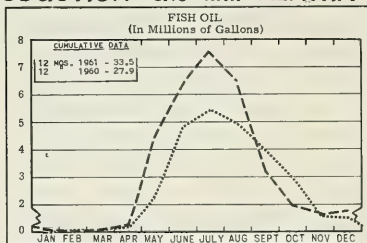
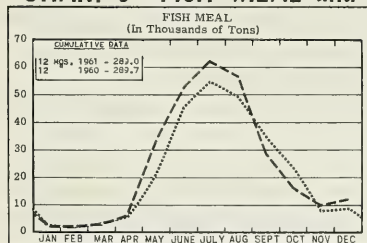
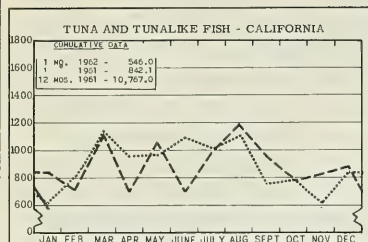
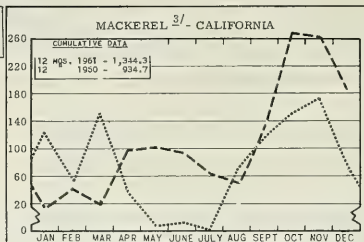


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

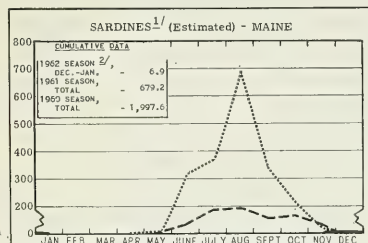
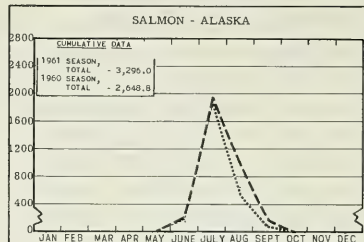
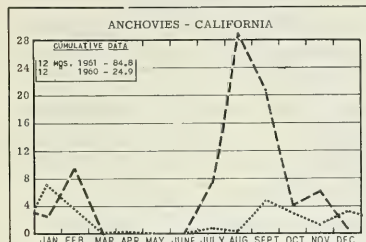
In Thousands of Standard Cases



LEGEND:
—•— 1962
--- 1961
..... 1960



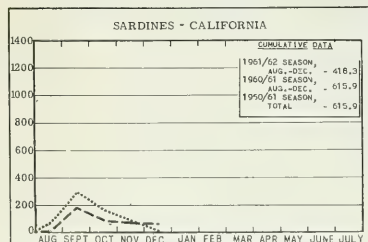
^{3/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
—•— 1961/62
--- 1960/61

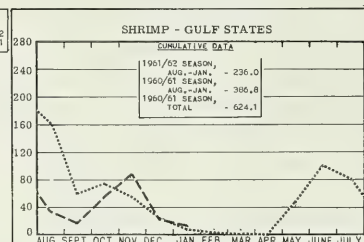
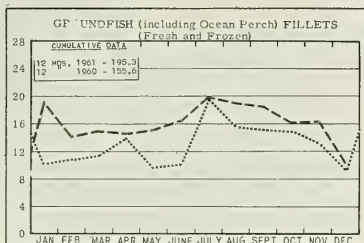
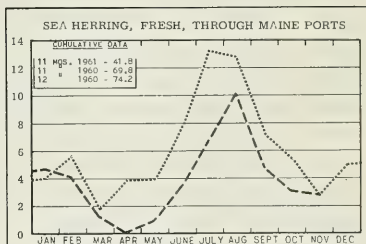
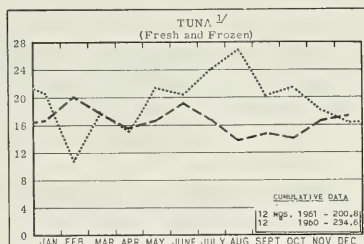
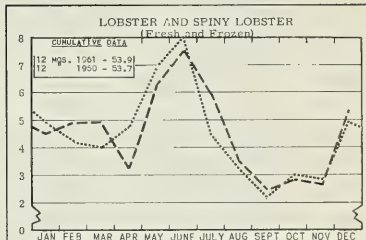
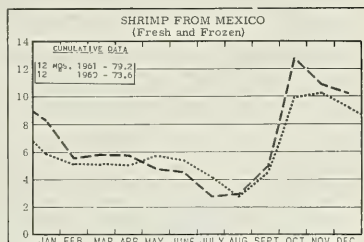
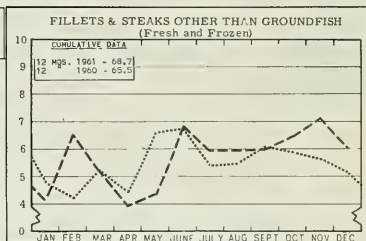


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

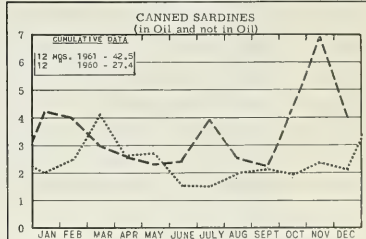
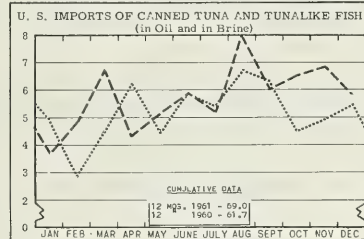
In Millions of Pounds



LEGEND:
----- 1961
..... 1960



1/2 EXCLUDES LOINS AND DISCS.





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

- | Number | Title |
|----------|-------------------------------------------------------------------|
| CFS-2541 | - Canned Fish & Pyroducts, 1960, Annual Summary (revised), 22 pp. |
| CFS-2542 | - Packaged Fish, 1960, Annual Summary (revised), 5 pp. |
| CFS-2685 | - Chesapeake Fisheries, 1960, Annual Summary, 7 pp. |
| CFS-2694 | - Gulf Fisheries, 1960, Annual Summary, 10 pp. |
| CFS-2746 | - Maine Landings, October 1961, 3 pp. |
| CFS-2747 | - Massachusetts Landings, August 1961, 5 pp. |
| CFS-2750 | - California Landings, August 1961, 3 pp. |
| CFS-2752 | - California Landings, August 1961, 3 pp. |
| CFS-2753 | - Georgia Landings, September 1961, 2 pp. |
| CFS-2754 | - Georgia Landings, October 1961, 2 pp. |
| CFS-2757 | - Michigan Landings, October 1961, 2 pp. |
| CFS-2758 | - Frozen Fish Report, November 1961, 8 pp. |
| CFS-2759 | - Wisconsin Landings, October 1961, 2 pp. |
| CFS-2760 | - Manufactured Fishery Products, 1960, Annual Summary, 7 pp. |
| CFS-2761 | - Louisiana Landings, August 1961, 2 pp. |
| CFS-2762 | - New Jersey Landings, October 1961, 4 pp. |
| CFS-2763 | - New England Fisheries, 1960, Annual Summary, 8 pp. |
| CFS-2764 | - Virginia Landings, October 1961, 4 pp. |
| CFS-2765 | - Texas Landings, September 1961, 3 pp. |
| CFS-2766 | - New York Landings, October 1961, 5 pp. |
| CFS-2768 | - Mississippi Landings, September 1961, 2 pp. |
| CFS-2769 | - Wisconsin Landings, November 1961, 2 pp. |
| CFS-2770 | - Minnesota Landings, October 1961, 2 pp. |
| CFS-2771 | - Texas Landings, October 1961, 3 pp. |
| CFS-2772 | - Ohio Landings, October 1961, 2 pp. |
| CFS-2774 | - Georgia Landings, November 1961, 2 pp. |
| CFS-2775 | - South Carolina Landings, November 1961, 2 pp. |
| CFS-2776 | - North Carolina Landings, November 1961, 4 pp. |
| CFS-2777 | - Maryland Landings, November 1961, 3 pp. |

- CFS-2778 - New Jersey Landings, November 1961, 4 pp.
CFS-2779 - Virginia Landings, November 1961, 4 pp.
CFS-2782 - Florida Landings, November 1961, 9 pp.
CFS-2784 - Fish Meal and Oil, November 1961, 2 pp.

SL-101 - Firms Canning Salmon, 1960 (Pacific Coast States), 3 pp.

Sep. No. 639 - Bluefin Tuna Concentration Found During a Long-Line Exploration of the Northwestern Atlantic Slope.

Sep. No. 640 - The Composition of Shrimp Meal Made From Fresh and Spoiled Shrimp Heads.

Sep. No. 641 - Oysters: Long Island Sound Spawning and Setting Observations, Summer 1961.

FL-524 - Cephalopods: Cuttlefish, Octopuses, Squids, by Lola T. Dees, 10 pp., illus., September 1961. Discusses in detail the physical characteristics of cephalopods and their food and feeding, locomotion, and reproduction. Describes the familiar cephalopods - cuttlefish, octopuses, and squids; their enemies and protection against them; methods of capture; and commercial utilization.

FL-526 - Sturgeons, by Lola T. Dees, 8 pp., illus., September 1961. Describes the physical appearance of the sturgeon, the species, physical characteristics, feeding and spawning habits, development of the young, decline of the stocks, protection in some states, methods of capture, and commercial value. Also discusses the preparation of caviar and isinglass; culture of sturgeon; and the North American, Asiatic, European, and related species.

Illustrations in Publications of the Fish and Wildlife Service, by Faxon W. Cook, Circular 116, 23 pp., illus., 1961.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Egg Development and Larval Stages of the Dolphin, by Satoshi Mito, 6 pp., illus., processed, December 1961. (Translated from Japanese, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, no. 3, 1960, pp. 223-226.)

On the Frequency Characteristics of Sea Noise and Fish School Sounds, by Minoru Nishimura, 12 pp., illus.,

processed. (Translated from Japanese, Technical Report of Fishing Boat, No. 15, March 1961, pp.111-118.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3630, HONOLULU, HAWAII.

The Distribution of Plankton in the Pacific Ocean and Its Relation to Geographical Zonation, by V. G. Bogorov, K. V. Beklemishev, and M. E. Vinogradov, 7 pp., illus., processed, January 1962. (Translation from Russian, 10th Pacific Science Congress, Honolulu, Hawaii, August 1961.)

On the Transformation of Plankton in the North Pacific Current and Adjacent Waters, by C. W. Beklemishev, 4 pp., illus., processed, January 1962. (Translation from Russian, 10th Pacific Science Congress, Honolulu, Hawaii, August 1961.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, November 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, November 1961, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1961, 7 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, December 1961, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, November and December 1961, 24 pp., each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary, September 1961, 26 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of other-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Efficiency Evaluation, Tracy Fish Collecting Facility, Central Valley Project, California, by Daniel W. Bates, Orren Logan, and Everett A. Pesonen, 98 pp., illus., processed, October 1960. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Pacific Region, 6116 Arcade Bldg., 1319 Second Ave., Seattle 1, Wash.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Effects of Copper Ore on the Ecology of a Lagoon, by Kenneth T. Marvin, Larence M. Lansford, and Ray S. Wheeler, Fishery Bulletin 184 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 12 pp., illus., printed, 15 cents, 1961.

"Normal Behavior of Chinook Salmon Fingerlings," by Roger E. Burrows, article, The Progressive Fish-Culturist, vol. 23, no. 1, 1961, p. 7, processed.

"A Staining Method for Marking Large Numbers of Small Fish," by James E. Deacon, article, Progressive Fish-Culturist, vol. 23, no. 1, 1961, pp. 41-42, processed.

"Trout Hepatoma--a Preliminary Report," by R. R. Rucker, W. T. Yasutake, and H. Wolf, article, Progressive Fish-Culturist, vol. 23, no. 1, 1961, pp. 3-7, processed.

"An Underwater Camera Case," by John L. Wagner and W. L. Hartman, article, Progressive Fish-Culturist, vol. 22, no. 4, 1960, pp. 188-191, processed.

Validity of Age Determination from Scales of Marked American Shad, by Mayo H. Judy, Fishery Bulletin 185 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 14 pp., illus., printed, 15 cents, 1961.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

1960 Alaska Commercial Fisheries Catch & Production Statistics, by Philip E. Chitwood, Statistical Leaflet No. 1, 20 pp., processed. Contains statistical tables showing fisheries operating units by region, catch summary, catch and value to fishermen by region and by gear, salmon catch by gear and region in numbers of fish, and salmon catch by district in numbers of fish. Tables also show 1958-60 average weight of salmon; transporting, wholesaling, and manufacturing; summary of products as prepared for market; and production of canned products in standard cases.

ANTIBIOTICS:

"The Ice-Antibiotic Treatment in the Preservation of Some Seafood Products," by C. Mateu and G. Varela. Chemical Abstracts, vol. 55, 3867a, February 20, 1961.

AUSTRALIA:

Annual Report for Year Ending June 30, 1961, 33 pp., illus., processed. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Australia. Covers activities of the Division of Fisheries and Oceanography, its cooperation with other institutions, and operation of research vessels. Also covers activities in physical oceanography, hydrology, chemical analysis of sea water, zooplankton research, bio-

chemistry, phytoplankton, bacteriology, benthos sampling, and marine fouling; fisheries oceanography, fish taxonomy, and fisheries biology.

BIBLIOGRAPHY:

A Bibliography--Effects of External Forces on Aquatic Organisms, by Frank J. Schwartz, Contribution No. 168, 88 pp., printed. Chesapeake Biological Laboratory, Solomons, Md., January 1961.

BLOOD OF FISH:

Distribution of Some Blood Constituents in Fishes from the Gulf of Mexico, by L. L. Sulya, B. E. Box, and Gordon Gunter, 4 pp., printed. (Reprinted from The American Journal of Physiology, vol. 199, no. 6, December 1960, pp. 1177-1180.) American Physiological Society, 9650 Wisconsin Ave. NW., Washington 14, D. C.

Some Evolutionary Patterns in Fishes' Blood, by Gordon Gunter, L. L. Sulya, and B. E. Box, 5 pp., printed. (Reprinted from Biological Bulletin, vol. 121, no. 2, October 1961, pp. 302-306.) Marine Biological Laboratory, Woods Hole, Mass.

BLUE CRABS:

"A Blue Blue Crab," by Paul A. Haefner, Jr., article Estuarine Bulletin, vol. 6, nos. 3 and 4, December 1961, pp. 3-5, illus., printed. Estuarine Bulletin, University of Delaware, Department of Biological Sciences, Newark, Del. Discusses the finding of a pale-blue-colored blue crab on a Delaware beach. Explains the various types of pigments found in crustaceans and the probable causes of the unique color of that particular specimen.

BRAZIL:

Sudene, Boletim de Estudos de Pesca, vol. 1, no. 1, October 1961, 22 pp., illus., processed in Portuguese. Sudene, Boletim de Estudos de Pesca, Superintendencia do Desenvolvimento do Nordeste, Departamento de Estudos Especiais, Recife, Brazil. Included in this issue are articles on a development program for maritime fisheries of northeast Brazil, biological studies on the commercial spiny lobsters of Recife, and the tuna fishery in tropical Atlantic exploratory areas.

BROWNING:

"Studies on the Browning of Fish Flesh. IV--Browning of Sugar with Certain Amino Acids by Heat," by Fumio Nagayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, January 1961, pp. 28-33, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BUFFALO FISH:

"Propagation of Buffalo Fishes," by Lee Brady and Andrew Hulsey, article, Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners, pp. 80-90, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

BUOYS:

A Technical Report of Research in Marine Science in Connection with Buoy Instrumentation Conducted during the Period 1 April 1960 to 31 March 1961, 28 pp., illus., processed. Fisheries Instrumentation Laboratory, Houghton, Wash.

CALIFORNIA:

"The Californian Market for Fish," by Charles S. Collins, article, Foreign Trade, vol. 116, no. 13, Decem-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ber 16, 1961, pp. 10-11, printed, single copy 20 Canadian cents. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Canada shipped 68 varieties of fish and byproducts valued at nearly \$3 million to California in 1959. These products included frozen Pacific halibut and coho salmon, frozen whitefish, pickled herring, kippers, finnan haddies, and smoked cod fillets. Despite large landings of fish and shellfish in California, imports of fishery products increased in 1960. According to the author, California continued to lead all other states in the pack of canned pet food made from fisheries products.

CANADA:

The Fisheries Problems Associated with the Power Development of the Puntledge River, Vancouver Island, B. C., 183 pp., illus., processed. Department of Fisheries, Vancouver, B. C., Canada, October 1958.

Fisheries Statistics of Canada, 1960 (Alberta and Northwest Territories), 21 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of the principal species of fish landed in Alberta, 1953-1960; and the quantity and value of fish landed by fisheries districts, 1959-1960. Also contains tables showing value of fishery products by species in the Northwest Territories, 1953-1960; quantity and value of fishery products by species, 1959-60; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1960 (Manitoba), 9 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of fishery products by species in Manitoba, 1953-1960; quantity and value of landings by species and fisheries districts, 1959-60; quantity and value of fishery products by species, 1959-60; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1960 (Ontario), 9 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1961. Contains tables giving the value of fishery products by species in Ontario, 1953-1960; quantity and value of landings by species and fisheries districts, 1959-60; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries.

Fishes of the Pacific Coast of Canada, by W. A. Clemens and G. V. Wilby, Bulletin No. 69, 2nd Edition, printed, C\$5. Fisheries Research Board of Canada, Ottawa, Canada, 1961. (For sale by the Queen's Printer and Controller of Stationery, Ottawa, Canada.) The composition of the marine fish fauna of the Pacific coast of Canada is extremely varied. A few northern, or arctic, fish have their southern limit of distribution on the British Columbia coast, and on the other hand certain southern pelagic forms tend to reach a northern limit. During the past few

years some unusual fish known mostly from other oceans have been found, and several unique fish living at great depths along the coast have become known. The fact that the 272 species recorded in this volume belong in 83 families indicates something of the varied character of the fish in this area.

CATCH RATE:

"Catch Curves and Mortality Rates," by D. S. Robson and D. G. Chapman, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 181-189, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

"Measurement of Potential Fishing Quality," by Robert S. Rupp, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 165-169, printed. Librarian, Colorado A & M College, Fort Collins, Colo.

CAVIAR:

"Bites of Caviar Mean Tons of Unwanted Sturgeon," article, Food Manufacture, vol. 36, April 1961, pp. 134-135, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

CODLING:

"Changes in Sugar Phosphates of Chilled Codling (*Gadus callarias*) Muscle," by J. R. Burt and N. R. Jones, article, Journal of the Science of Food and Agriculture, vol. 12, April 1961, pp. 344-347, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

DEODORIZATION:

"Deodorized Fish Products," by Ezra Levin. Chemical Abstracts, vol. 55, 11701d, June 12, 1961.

DOGFISH:

"Comments on the Smooth Dogfish, *Mustelus canis*, from Chesapeake Bay, Maryland," by Frank J. Schwartz, article, Chesapeake Science, vol. 1, no. 2, 1960, pp. 124-125, printed. Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

DRIFT NETS:

"Ob Izmenenii Vysoty Drifternoi Seti pri Dreife (On Changes in Height of a Driftnet in Wind), by A. M. Karpelianskii, article, Rybnoe Khoziaistvo, vol. 35, no. 12, 1959, pp. 39-42, illus., printed in Russian. VNIRO, Glavniproekta, pri Gosplanie, SSSR, Moscow, U.S.S.R.

EELS:

The Freshwater Eels (*ANGUILLA* spp.) of Southern Africa. An Introduction to Their Identification and Biology, by R. A. Jubb, illus., printed. (Reprinted from Annals of the Cape Provincial Museums, March 1961.) Albany Museum, Grahamstown, South Africa Republic.

ELECTRICAL FISHING:

"Bibliographie über die Elektrofischerei und Ihre Grundlagen" (Bibliography on Electrical Fishing and Its Fundamentals), by P. F. Meyer-Waarden, Egon Halsband, and Inge Halsband, article, Archiv

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

fur Fischereiwissenschaft, vol. 11, no. 1, 1960, 104 pp., printed in German. Bundesforschungsanstalt fur Fischerei, Hamburg, Germany.

A Note on the Effect of Electric Fields on GADUS VIRENS, by Olav Dragesund and Helge Leivestad, Fiskeridirektoratets Skrifter, Serie Havundersokelser, vol. XII, no. 4, 7 pp., illus., printed. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1959.

EUROPE:

"Probable Development of Fish Industries in Europe during the Future 20 Years," by M. B. F. Ranken, article, *Peche Maritime*, no. 993, December 1960, pp. 807-817, illus., printed in French. *Peche Maritime*, 190 Boulevard Haussmann, Paris 8, France.

FACTORYSHIPS:

"A Plant for the Freezing of Whalemeat on Board a Modern Factoryship," by E. Hofmann, article, *Linde Ber.*, Germ., No. 10, November 1960, pp. 8-11, printed. Abstract 9498, Bulletin de L'Institut International du Froid, vol. 41, No. 2, 1961. International Institute of Refrigeration, 177 Blvd. Malesherbes, Paris 17, France.

FATTY ACIDS:

"Distribution and Function of Essential Fatty Acids in Mitochondria," by Richardson, Tappel, and Gruger, article, *Archives of Biochemistry and Biophysics*, vol. 94, no. 1, July 1961, pp. 1-6, printed. *Archives of Biochemistry and Biophysics*, Academic Press Inc., 111 5th Ave., New York 3, N. Y.

FISH BEHAVIOR:

"Studies on the Swimming Noise of the Fish," by Michio Uno and Tuneso Konagaya, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, no. 11, 1960, pp. 1069-1073, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

Symposium on Fish Behaviour, Proceedings of the Indo-Pacific Fisheries Council, 1958, 116 pp., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1960.

FISH FACILITIES:

"The Fish Facilities at the Whitehorse Rapids Power Development, Yukon Territory," by R. N. Gordon, R. A. Crouter, and J. S. Nelson, article, *The Canadian Fish Culturist*, no. 27, August 1960, pp. 43-56, printed. The Canadian Fish Culturist, Information and Educational Service, Department of Fisheries, Ottawa, Canada.

FISH-LIVER OIL:

"Alkali Digestion for Producing Vitamin Oil from Fish Liver," by Hideo Higashi, Yaichiro Shimma and Hisako Taguchi. *Chemical Abstracts*, vol. 55, 8769h, May 1, 1961.

"Prevention of the Injurious Effects of Excessive Cod-Liver Oil by its Fortification with Vitamin E," by T. Moore and I. M. Sharman, article, *British Journal of Nutrition*, vol. 15, No. 2, 1961, pp. 297-303, printed. *British Journal of Nutrition*, Cam-

bridge University Press, 32 E. 57th St., New York 22, N. Y.

FISH MEAL:

Low-Fat Fish Meal, Norwegian Patent 96, 116, May 23, 1960. *Chemical Abstracts*, vol. 55, May 1, 1960 8696f.

FISH MORTALITY:

"Definitive Diagnosis of Fish Mortalities," by E. M. Wood, article, *Journal of Water Pollution Control Federation*, vol. 32, no. 9, 1960, pp. 994-999, printed. *Journal of Water Pollution Control Federation*, Prince and Lemon Sts., Lancaster, Pa.

FISH POPULATIONS:

"A Mechanical Model for the Study of Population Dynamics," by Oliver P. Pearson, article, *Ecology*, vol. 41, no. 3, 1960, pp. 494-508, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

"Suggested Standard Methods of Reporting Fish Population Data for Reservoirs (Prepared for the Reservoir Committee, Southern Division of the American Fisheries Society)," by Eugene W. Surber, article, *Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 313-325, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

FISH SAUSAGE:

"Studies on the Heat Sterilization of Fish Sausage (1)," by Eiichi Tanikawa, Misao Suwaki and Minoru Akiba, article, *Bulletin of Faculty of Fisheries, Hokkaido University*, vol. 10, February 1960, pp. 332-336, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

FISHERY DYNAMICS:

"A Standard Terminology and Notation for Fishery Dynamics," by S. J. Holt and others, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 25, no. 3, 1959, pp. 245-248, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISHERY OCCUPATIONS:

Training Programs for Fishery Occupations, OE-84025, 61 pp., printed, 20 cents. Office of Education, U. S. Department of Health, Education and Welfare, Washington, D. C., 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A booklet containing information on fishery occupational training. Discusses the United States fishing industry; advisory services; national associations; Federal and State agencies; areas of instruction for high schools and short courses; instructional units; and institutions offering courses in fisheries and related sciences.

FISHING WITH LIGHTS:

Improvement of Techniques for Fishing with Lights, by Francois Bourgois and Luigi Farina, General Fisheries Council for the Mediterranean, Studies and Reviews No. 17, 28 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, November 1961.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Describes trials made between 1957 and 1959 by FAO experts for the purpose of determining what technical advances could be introduced into Tunisian fishing practices. Discusses in detail light-fishing methods, fishing lamps, generator sets, findings of detection and control trials, practical implications of detection and control findings, and distribution of gear and dissemination of new techniques. Includes photos of gear and vessels and drawings of equipment used in fishing with lights.

"Primeneniye Svetovoykh Blokov pri Love Kilki Rybonasosom" (Use of Bunches of Lamps in Fishing for Sprats with Fish Pumps), by I. V. Nikonov, article, *Rybnoe Khoziaistvo*, vol. 35, no. 12, 1959, pp. 42-47, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISHWAYS:

Design of Fishways and Other Fish Facilities, by C. H. Clay, 300 pp., illus., printed, \$5. Queens Printer, Ottawa, Canada, 1961.

FLORIDA:

"Exploited Fish Populations of the St. Johns River, Florida," by Harold L. Moody, article, *The Quarterly Journal of the Florida Academy of Sciences*, vol. 24, no. 1, 1961, pp. 1-18, printed, *Quarterly Journal of the Florida Academy of Sciences*, University of Florida, Gainesville, Fla.

A Survey of the Number of Anglers and of Their Fishing Effort and Expenditures in the Coastal Recreational Fishery of Florida, by Robert W. Ellis, Albert Rosen, and Alan W. Moffett, Technical Series No. 24, 50 pp., printed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1958.

FLOUNDER:

"Length Shrinkage of Yellowtail Flounder between Live and Landed Condition," by Fred E. Lux, article, *Transactions of the American Fisheries Society*, vol. 89, no. 4, 1960, pp. 373-374, printed *Transactions of the American Fisheries Society*, Librarian, Colorado A & M College, Fort Collins, Colo.

FLUKE:

"Age and Growth of the Fluke in Great South Bay and Their Significance to the Sport Fishery," by John C. Poole, article, *New York Fish and Game Journal*, vol. 8, no. 1, 1961, pp. 1-18, printed. New York Fish and Game Journal, New York Conservation Department, Albany 1, N. Y.

FOOD AND AGRICULTURE ORGANIZATION:

Informe al Gobierno de Chile sobre la Pesca en Aguas Continentales en la Region de los Lagos (Report to the Government of Chile on the Fishery in Inland Waters in the Lakes Region), by Cecil Miles, FAO Fisheries Biology Report No. 28, 87 pp., illus., processed in Spanish, limited distribution. Food and Agriculture Organization of the United Nations, Rome, Italy, September 1961.

Recent Trends in Fisheries, 1960-61, FAO Fisheries Papers, no. 19, October 1961, 10 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale

delle Terme di Caracalla, Rome, Italy. Discusses details of world fish production, fishery products utilization and trade, prices, and fishery policies. Includes statistical tables showing world catch by continent, average 1953-57, 1958 to 1960; and utilization of catches, 1955 to 1960.

Report on FAO-IPFC Training Centre in Fishery Statistics Held at Bombay, India (13th February-30th April, 1959), by V. G. Panse and K. V. R. Sastry, 155 pp., illus., printed. Indian Council of Agricultural Research, New Delhi, India, September 1960.

Some Notes on the Use of the Manatee (TRICHECHUS) for the Control of Aquatic Weeds, FAO Fisheries Biology Technical Paper No. 13, 8 pp., processed, distribution limited. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, September 1961. Discusses the appearance and occurrence of the manatee or sea cow, its possible use for aquatic weed control, popular articles on the manatee, and drawbacks to transplanting this mammal to a new environment. Concludes that "the introduction of manatees to other parts of the world may eventually prove to be useful, but the present state of our knowledge does not permit any recommendation to this effect."

A World List of Experts Concerned with the Study of Tuna, FAO Fisheries Biology Technical Paper No. 10, 14 pp., processed, distribution limited. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, February 1961.

FREEZING-CANNING:

"Some Recent Advances in Food Science. Frigi-Canning," by C. J. B. Smit, article, *Food Industries of South Africa*, vol. 13, no. 8, January 1961, p. 49, printed. Food Industries of South Africa, Odhams Press, South Africa (Pty) Ltd., Trust House, Thibault Square, Cape Town, South Africa Republic.

FREEZE-DRYING:

"Accelerated Freeze Drying. 2--Fundamental Design Problems," by K. Ward, article, *Food Manufacture*, vol. 36, no. 2, February 1961, pp. 60-63, 66, illus., printed. Food Manufacture, Leonard Hill, Ltd., 9 Eden St., London NW1, England.

Accelerated Freeze-Drying Method of Food Preservation, 173 pp., illus., printed, \$2.25. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1961. Discusses in detail how a process was devised whereby a wide variety of food could be freeze-dried, hundreds of pounds at a time, in a period of about eight hours. The product of this method of food preservation, if suitably packaged, can be transported and stored without refrigeration. Section A of the report deals with the engineering angle, including packaging and economics; Section B advises on choice of raw materials, and the preparation, storage, reconstitution, and nutritive value of prepared foods.

"Freeze-Drying of Food Products on a Commercial Scale, article, *Modern Refrigeration*, vol. 64, no. 756, March 1961, pp. 250-251, illus., printed. Modern Refrigeration, Maclaren House, 131 Great Suffolk St., London SE1, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Freeze-Drying Where it Stands in Europe," by John N. Nair, article, *Food Engineering*, vol. 33, March 1961, pp. 31-34, printed. *Food Engineering*, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

"Lyophilisation of Foodstuffs," by Henaff, article, 5th Symposium on Foreign Matters in Foods, Budapest, May 11-16, 1959, pp. 393-412, illus., printed, *Bulletin of the International Institute of Refrigeration*, vol. 41, no. 4, 1961, Abstract 9867.

"Point Up Freeze-Dry Phenomena," by John H. Nair, article, *Food Engineering*, vol. 33, May 1961, pp. 57, 61, printed. *Food Engineering*, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

FREEZING:

"Direct Conduction' Double Contact Plate Freezers," article, *Norwegian Fishing and Maritime News*, vol. 8, 1961, pp. 25, 31, printed. *Norwegian Fishing and Maritime News*, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"Fish-Handling and Preservation. IV--Practices in Freezing and Frozen Storage," by W. A. Empey, article, *Food Preservation Quarterly*, vol. 19, no. 1, March 1959, pp. 2-9, printed. Commonwealth Scientific and Industrial Research Organization, Homebush, N. S. W., Australia.

"Heat Transfer When the Fish is Frozen in the Freezer," by J. Nagoaka, article, *Refrigeration*, vol. 36, no. 402, April 1961, pp. 20-51, illus., printed in Japanese with English summary. Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

Kacestvennye Izmeneniya Ryby pri Zamorazivanii (Quality Changes in Fish on Freezing), by A. I. Piskarev, A. K. Kaminarskaja, and L. G. Luk'janica, 40 pp., illus., printed in Russian. V/O Mezhdunarodnaya Kniga, Moscow 200, U.S.S.R.

"Streamlined Quick-Freezing of Fish at Factories in Cape Town," article, *Food Industries of South Africa*, vol. 13, no. 12, May 1961, pp. 25-31, illus., printed. Food Industries of South Africa, Odhams Press, South Africa (Pty) Ltd., Trust House, Thibault Square, Cape Town, South Africa Republic.

"O Vlijanii Casticnogo Vymorazivaniya Vody na Kacestvennoe Sostojanie Ryby i Sroki ee Hranenija" (Effect of Subfreezing on Fish Quality), by N. A. Golovkin and L. I. Persina, article, *Kholodil'naja Tehnika*, no. 1, 1961, pp. 35-38, printed in Russian. Kholodil'naja Tehnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

FROZEN FISH:

"Preservation of Frozen Fish by Addition of Antioxidants on Glazing," by R. R. Perepletchik and E. I. Novikova. *Chemical Abstracts*, vol. 54, 17741f, September 10, 1960.

FUR SEALS:

"Fur Seals Breeding in the Falkland Islands Dependencies," by F. A. O'Gorman, article, *Nature*, vol. 192, no. 4806, December 9, 1961, pp. 914-916, illus.,

printed, 3s. 6d. (about 45 U.S. cents). *Nature*, St. Martin's Press, 175 Fifth Ave., New York 10, N. Y. Discusses the fur-seal herds in the Falkland Islands Dependencies, south of South America. Great numbers of fur seals were taken in the Falklands in the early 19th Century and subsequently became nearly extinct. Recent expeditions to this area have shown the existence of several small herds of fur seals, some of which were breeding. The author concludes that "It is hoped that these colonies, especially those in the South Shetlands will be strictly protected in keeping with the resolution on conservation in Antarctica passed by the Special Committee on Antarctic Research of the International Council of Scientific Unions, and allowed to re-inhabit the areas where they were once so numerous and so wantonly destroyed."

GENERAL:

"Fishes of Worldwide (Circumtropical) Distribution," by John C. Briggs, article, *Copeia*, no. 3, 1960, pp. 171-180, printed. *Copeia*, American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

Living Fishes of the World, by Earl S. Herald, illus., printed, \$9. Doubleday and Company Inc., Garden City, N. Y., 1961.

Transactions of the American Fisheries Society, vol. 90, no. 3, printed, \$2.50. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va., 1961. Includes articles on the effects of DDT spraying for budworm on fish in the Yellowstone River system; survival of brook trout in two Michigan trout streams; acute toxicity of some organic insecticides to three species of salmonids; restoration of anadromous alewives at Long Pond, Maine; and some effects of rotenone products on municipal water supplies. Also includes articles on propagation of northern pike; food and distribution of lake whitefish at Lac La Ronge, Saskatchewan; development of a system for controlling dissolved-oxygen content of water; behavior of splake and brook trout fingerlings; lower efficiency in deflecting downstream migrant steelhead; and gill-net selectivity of lake whitefish from Goderich-Bayfield area, Lake Huron.

GERMAN FEDERAL REPUBLIC:

Jahresbericht über die Deutsche Fischwirtschaft, 1960/61 (Annual Report on German Fisheries, 1960/61), issued by the Ministry of Food, Agriculture, and Forestry in cooperation with the Federal Statistical Office, 304 pp., illus., printed in German with English table of contents and summaries. DM 25 (about US\$6.25). (Available from Gebr. Mann, Berlin-Schoeneberg, Hauptstrasse 26, Germany, 1961.) A review covering all phases of the German fisheries in 1960/61. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply in the Federal Republic of Germany, organization of the fishing industry, the fishing fleet, biological-statistical report on the German deep-sea fishery, foreign trade in fishery products, interzonal trade, and imports of fishery products in Common Market countries. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part

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III presents data on the German deep-sea fishery in 1960, the lugger herring fishery, the cutter deep-sea and coastal fisheries, fresh-water fisheries, processing of fish and shellfish, propaganda campaign, and promotional activities. Part IV gives data on foreign fisheries and whaling.

GERMANY:

Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung (Proceedings of the Scientific Commission for Sea Fisheries Research), Neue Folge, Band XVI, Heft 2, 1961, 160 pp., illus., printed in German with English summaries. Berichte der Deutschen Wissenschaftlichen Kommission für Meerforschung, E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart W., Germany.

GILL-NETTING:

"Nekotorye Voprosy Teorii Lova Ryby Zhabernymi Setiami" (Certain Problems of the Theory of Fishing with Gillnets), by N. N. Andreev, article, Trudy VNIRO, vol. 30, 1955, pp. 109-127, illus., printed in Russian. VNIRO, Pishchepromizdat, Moscow, U.S.S.R.

HALIBUT:

Regulation and Investigation of the Pacific Halibut Fishery in 1960, Report of the International Pacific Halibut Commission No. 30, 24 pp., illus., printed. International Pacific Halibut Commission, University of Washington, Fisheries Hall #2, Seattle 5, Wash., 1961. A brief report of the accomplishments of the Commission during 1960 covering its historical background, activities during the year, 1960 regulations, statistics of the fishery, landings by ports, and modification of fishing seasons. Also covers catch per unit of fishing effort, composition of the catches, growth studies, tagging experiments, and studies of halibut below commercial size.

HERRING:

"Estimation of the Stock Strength of the Norwegian Herring," by O. Aasen, article, Journal du Conseil Permanent International pour l'Exploration de la Mer, vol. 24, no. 1, 1958, pp. 95-110, printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark.

"Herring Movements in the Bay of Fundy and Gulf of Maine, 1957 and 1958," by R. A. McKenzie and S. N. Tibbo, article, Journal of Fisheries Research Board of Canada, vol. 18, no. 2, 1961, pp. 221-252, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

International North Pacific Fisheries Commission, Bulletin No. 4 (The Exploitation, Scientific Investigation and Management of Herring (*Clupea pallasii*) on the Pacific Coast of North America in Relation to the Abstinence Provisions of the North Pacific Fisheries Convention), 106 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada, August 1961. Presents a series of papers submitted to the Commission over a period of approximately four years by the Governments of Canada, Japan, and the United States. Their purpose was to provide information which would aid the Commission to make a determination as to whether these herring stocks

continued to qualify for abstinence from fishing by Japan, under the provisions of the International Convention for the High Seas Fisheries of the North Pacific Ocean. The Governments of Canada, Japan, and the United States accepted the Commission's recommendation, and on May 24, 1960, herring off the coast of Alaska were removed from the list of stocks under abstinence. Continued under abstinence were herring of British Columbia and stocks of herring along the coast of the United States south of the entrance to the Strait of Juan de Fuca.

"Swimming Speed of Immature Atlantic Herring with Reference to the Passamaquoddy Tidal Project," by H. C. Boyar, article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 21-26, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

HORSE MACKEREL:

"Biochemical Studies on Lipides of Horse Mackerel (*Trachurus japonicus*)," by Hideo Tsuyuki, Uhei Naruse, and Akio Shionoya. Chemical Abstracts, vol. 55, 9911e, May 15, 1961.

INDIANS:

"Fishing . . . Indian Way," by Don Neal, article, Pennsylvania Angler, vol. 30, no. 12, December 1961, pp. 3-5, illus., printed, 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Discusses the selection of a site for a village which was advantageous for fishing, construction of a net, ceremonies and activities of the fish kill, preparation of the fish, and the last recorded fish kill in Pennsylvania before World War I.

INTERNATIONAL COMMISSIONS:

International North Pacific Fisheries Commission, Bulletin No. 3, 58 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada. August 1961. Includes these articles: "Observations of Molting Female King Crabs, *Paralithodes camtschatica* (Tilesius)," by Henry M. Sakuda; "Stomach Contents of the Bering Sea King Crab," by Patsy A. McLaughlin and James F. Hebard; "Currents in Southeastern Bering Sea," by James F. Hebard; "Method Used to Distinguish Between Immature and Maturing Sockeye and Chum Salmon Taken by Canadian Exploratory Fishing Vessels in the Gulf of Alaska," by Harold Godfrey; "Criteria for the Differentiation of Mature and Immature Forms of Chum and Sockeye Salmon in Northern Seas," by Rikichi Ishida, Kenji Takagi, and Setsuko Arita; and "Blood Types in Pacific Salmon," by George J. Ridgway and George W. Klontz.

IRRADIATED FOODS:

"Evaluation of the Palatability of Irradiated Foodstuffs," by H. R. Kraybill, article, Irradiation des Aliments, vol. 1, no. 2, October-December 1960, pp. A2-A3, printed in French. Bulletin of the International Institute of Refrigeration, vol. 41, no. 4, 1961, Abstract 9898.

"Note on the Palatability of Irradiated Food," by B. Connor Johnson, article, Irradiation des Aliments, vol. 1, no. 2, October-December 1960, pp. A4-A5. Bulletin of the International Institute of Refrigeration, vol. 41, no. 4, 1961, Abstract 9899.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

IRRADIATION:

"Preservation of Fish and Shellfish by Relatively Low Doses of Beta Radiation and Antibiotics," by Peter A. Lerke, Lionel Farber and Wolfgang Huber, article, Food Technology, vol. 15, March 1961, pp. 145-152, printed. Food Technology, The Garrard Press, 510 North Hickory St., Champaign, Ill.

"Progress is Being Made in Food Radiation," by Ferdinand P. Mehrlich, article, Food Processing, vol. 22, May 1961, pp. 40-43, printed. Food Processing, Putnam Publishing Co., 111 East Delaware Place, Chicago, Ill.

Strahlenkonservierung und Kontamination von Lebensmitteln (Irradiation Storage and Contamination of Foodstuffs), by J. Kuprianoff and K. Lang, 297 pp., illus., printed in German, DM 64 (about US\$16). Verlag Dr. Dietrich Steinkopff, Holzhofallee 35, Darmstadt, Germany.

ISRAEL:

Fishermen's Bulletin, vol. 3, no. 9 (29), September 1961, 32 pp., illus., printed in Hebrew with some English abstracts. Fishermen's Bulletin, Sea Fisheries Research Station, P. O. Box 699, Haifa, Israel. Includes, among others, these articles: "Observations on the Reaction of Fishes to Artificial Light (II)," by A. Ben-Tuvia; "Trawl Fisheries in the North Atlantic (II)," by M. Kramer; "The Maiden Voyage of the Fishing Vessel Daguite (I)," by Z. Fried; "Fishing Harbours in Israel," by J. Tauman; "The Layout of F/V Daguite," by J. Bejerano; and "Dalyan' a Turkish Trap-Net and its Possible Use in Eilat," by S. Levin.

KENYA:

Report on Kenya Fisheries, 1960, 28 pp., printed, 3 s. (about 42 U. S. cents). Government Printer, Nairobi, Kenya, 1961. Reviews the work done in inland fisheries development, Lake Victoria fisheries, a fish culture farm, and a trout hatchery and fisheries. The section on sea fisheries covers fresh, chilled, and frozen fish; imports of fishery products; the dried fish industry; the dried shark fishery; crawfish; green turtles; shellfisheries; and game fishing. Fishing investigations and gear development are discussed and several tables on imports, exports, and catch are included.

KOREA:

Outline of Development and Research Activities in Korean Fisheries, by Lee Bong Nai, 40 pp., processed. Central Fisheries Experiment Station, Ministry of Agriculture and Forestry, Republic of Korea, Pusan, Korea. Discusses the general characteristics of Korean fisheries: fishing boats; fishing methods, size of boat, and fishing time; fishing ports; and landings of fish and shellfish and utilization. Also covers development and research activities: exploratory fishing and fishing gear development; processing and food technology development; aquiculture and marine research.

LAKE TROUT:

"The Lake Trout of Lac La Ronge, Saskatchewan" by D. S. Rawson, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 3, 1961, pp. 423-462, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

search Board of Canada, vol. 18, no. 3, 1961, pp. 423-462, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

LAKE VICTORIA:

"A Revision of the Lake Victoria Haplochromis Species (Pisces, Cichlidae) Part IV" by P. H. Greenwood, article, Bulletin of the British Museum (Natural History), Zoology, vol. 6, no. 4, 1960, pp. 229-281, printed. The British Museum (Natural History), Zoology, Cromwell Rd., London SW1, England.

LAMPREYS:

"Incidence of Lamprey Scarring on Fish in the Upper Mississippi River, 1956-58," by Raymond C. Hubley, Jr., article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 83-85, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

LIGHT:

"Possible Effect of Lethal Visible Light on Year-Class Fluctuations of Aquatic Animals," by Alfred Perlmutter, article, Science, vol. 133, no. 3458, 1951, pp. 1081-1082, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

LOUISIANA:

Compilation of Louisiana Laws Pertaining to Wild Life and Fisheries, 1958 (Louisiana Revised Statutes of 1950 Including Acts of 1950 Regular Session of the Legislature, as Amended), 215 pp.; 1960 Supplement (Containing the Acts of 1960 of the Regular Session of the Legislature and a Digest and Summary of the Acts of 1960), 79 pp., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

MACKEREL:

Lecture Notes Prepared for the International Training Centre on the Methodology and Techniques of Research on Mackerel (RASTRELLIGER) (Bangkok, Thailand, 20 October-28 November 1958), 125 pp., illus., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, February 1959.

MANATEES:

"The Manatee: Ecology and Use for Weed Control," by W. H. L. Allsopp, article, Nature, vol. 188, no. 4752, 1960, p. 762, printed. Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"The Manatee in the Lesser Antilles," by C. E. Ray, article, Journal of Mammalogy, vol. 41, no. 3, 1960, pp. 412-413, printed. American Society of Mammalogists, 1041 New Hampshire St., Lawrence, Kans.

MARINE BIOLOGY:

Marine Biology. Transactions of the Institute of Oceanology, vol. 20, edited by B. N. Nikitin, 302 pp., printed, \$10. American Institute of Biological Sciences, 2000 P St. NW., Washington 6, D. C.

MARINE FISH:

"Mortality of Marine Fishes Following Tropical Rainstorms," by Ivan Goodbody, article, Association of Island Marine Laboratories, 2nd Meeting, 1958, p. 17, printed. Association of Island Marine Laboratories,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Bermuda Biological Station, Bermuda, British West Indies.

MARINE PLANTS:

"Plantas Marinas de la Zona de las Mareas de El Salvador" (Intertidal Marine Plants of El Salvador), by E. Yale Dawson, article, *Pacific Naturalist*, vol. 2, no. 8, July 31, 1961, pp. 389-461, illus., printed in Spanish and English. Beaudette Foundation for Biological Research, Box 482, R. F. D. 1, Solvang, Calif.

MARYLAND:

Final Report--Maryland Commission on Research and Education, 1941-1961, 21 pp., printed. Department of Research and Education, Annapolis, Md., May 31, 1961. Summarizes the functions of the Maryland Commission of Research and Education during the period 1941-1961, in anticipation of its transfer to the University of Maryland as the newly created Natural Resources Institute. Discusses the history of fisheries research in Maryland; work of the various divisions; research conducted on oysters, clams, crabs, fish, plankton, and inland resources; contract activities; and regulatory activities. Also includes a list of publications of the Chesapeake Biological Laboratory and Maryland Department of Research and Education.

Record Maryland Fish (Salt and Brackish Species), by Frank Schwartz, Educational Series No. 49, 6 pp., printed. (Reprinted from *Maryland Conservationist*, vol. 38, no. 3, May-June 1961.) Department of Game and Inland Fish, State Office Bldg., Annapolis, Md.

Record Maryland Fish (These are the Champs), by Harold J. Elser, Educational Series No. 51, 3 pp., printed. (Reprinted from *Maryland Conservationist*, vol. 38, no. 2, March-April 1961.) Department of Game and Inland Fish, State Office Bldg., Annapolis, Md.

MIDDLE ATLANTIC:

Fishes of Chincoteague and Sinepuxent Bays, by Frank J. Schwartz, 25 pp., illus., printed. (Reprinted from *The American Midland Naturalist*, vol. 65, no. 2, April 1961, pp. 384-408.) The American Midland Naturalist, University of Notre Dame Press, Notre Dame, Ind. A comprehensive monthly trawl survey of Maryland and Virginia's Sinepuxent and Chincoteague Bays found 65 species of fish within 40 families and 59 genera currently occupying those two seaside bays. Twenty-three species were new to the fauna which, since 1876, now totals 99 species. Various methods, beach seining, crab potting, hook and line fishing, and wire oyster test trays, were employed to capture smaller species.

MORTALITIES:

"Definitive Diagnosis of Fish Mortalities," by E. M. Wood, article, *Journal of the Water Pollution Control Federation*, vol. 32, 1960, pp. 994-999, printed. *Journal of the Water Pollution Control Federation*, Prince and Lemon Sts., Lancaster, Pa.

NETS:

"Choice and Use of Synthetic Fibers for Fresh Water Fishery," by G. Klust, article, *Fischwirt*, vol. 9, 1959, pp. 221-234, printed in German. Deutscher

Fischerei-Verband, Neuerwall 72, Hamburg 36, Germany.

"Measures for Preventing Damages to Driftnets," by N. K. Piaterikin, article, *Rybnoe Khoziaistvo*, vol. 34, 1958, pp. 30-38, printed in Russian. VNIRO Glavni-proekta, pri Gosplan SSSR, Moscow, U.S.S.R.

"The Use of Hobbled Gill Nets in a Commercial Fishery of Lake Carl Blackwell, Oklahoma," by William R. Heard, article, *Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 90-95, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

NORWAY:

Norges Fiskerier, 1959 (Fishery Statistics of Norway, 1959), Norges Offisielle Statistikk XII 60, 94 pp., illus., printed in Norwegian with English summary. Fiskeridirektoren, Bergen, Norway, 1961. Contains data on the number of Norwegian fishermen, vessels, processing plants, and gear; quantity and value of total landings; various types of herring; sprat; cod; mackerel; tuna; dogfish; capelin; deep-water shrimp; distant-water fisheries; groundfish trawling; catch of small whales and seals. Also includes statistical tables showing quantity and value of sea fisheries, 1910-1960; production of some fishery products, 1956-1959; winter herring landings; exports and imports of fishery products, 1957-1959; landings of principal species of fish, by months; and related data.

NUTRITION:

"Nutritive Value of Fish. II--Biotin, Folic Acid, Pantothenic Acid, and Free Amino Acids of Various Salt-Water Species," by M. E. Loughlin and A. E. Terri, article, *Food Research*, vol. 25, 1960, pp. 479-483, printed. Institute of Food Technologists, 510/22 N. Hickory St., Champaign, Ill.

NUTRITIVE VALUE:

"Nutritive Value of Fresh Fish, Canned Fish, and Fish Meal," by Werner G. Jaffe. *Chemical Abstracts*, vol. 55, 6719h, April 3, 1961.

OCEANOGRAPHY:

"The International Indian Ocean Expedition," by John A. Knauss, article, *Science*, vol. 134, no. 3491, November 24, 1961, pp. 1674-1676, printed, single copy 35 cents. Science, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C. The author states that a concerted effort will be made by scientists to learn as much as possible about the Indian Ocean in the next few years. At least 20 ships from a dozen countries will participate. The work will consist of the probable establishment of a marine taxonomic center somewhere in India; the operation of a laboratory ship for 2 years in the Indian Ocean for the purpose of studying marine biological problems; a series of geological and geophysical reconnaissance surveys of parts of the Indian Ocean; and an increase in the network of upper-air meteorological stations for studying the monsoon circulation. United States participation will include projects by the Woods Hole Oceanographic Institution, the U. S. Coast and Geodetic Survey, the Scripps Institution of Oceanography of the University of California, the Narragansett

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Marine Laboratory of the University of Rhode Island, and the National Institute of Oceanography.

"Probable Effects of Proposed Passamaquoddy Power Project on Oceanographic Conditions," by R. W. Trites, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 2, 1961, pp. 163-201, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Use of Drift Bottles in Fisheries Research," by D. Vaux and A. M. Olsen, article, Fisheries Newsletter, vol. 20, no. 1, 1961, pp. 17-20, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

OYSTERS:

"The Chemical Composition of the Gastric Shield of the Oyster Crasostrea virginica (Gmelin)," by Barbara L. Shaw and Helen I. Battle, article, Canadian Journal of Zoology, vol. 37, 1959, printed. Division of Administration, National Research Council, Sussex St., Ottawa 2, Canada.

OYSTER TOADFISH:

A Bibliography of Papers Dealing with the Oyster Toadfish, OPSANUS TAU, by Paul F. Robinson, Contribution No. 183, 8 pp., processed. Natural Resources Institute, Chesapeake Biological Laboratory, Solomons, Md.

PACKAGING:

"New Flexibility for Fish-Stick Packaging," article, Food Processing, vol. 22, July 1961, p. 74, printed. Food Processing, Putman Publishing Co., 111 East Delaware Place, Chicago 2, Ill.

PERCH:

Ecology and Territorial Behaviour of the Script Perch (SERRANUS SCRIBA Cuv.), by Rosl Kirchshofer, Translation Series No. 341, 17 pp., processed. (Translated from German, Osterreichische Zoologische Zeitschrift, vol. 5, 1954, pp. 329-349.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1961.

PESTICIDES:

"Effects of Pesticides on Commercial Fisheries," by Philip A. Butler, article, Proceedings of the Gulf and Caribbean Fisheries Institute, vol. 13, 1960, pp. 168-172, printed. Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

PLANKTON:

Phytoplankton of Chesapeake Bay (An Illustrated Guide to the General), by Ruth E. Griffith, Contribution No. 172, 82 pp., illus., printed. Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons, Md., May 1961.

POLLUTION:

Pollution-Caused Fish Kills, January-September 1961, 7 pp., processed. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., November 1961.

"Pollution and the Fisheries," by A. L. Pritchard, article, Papers of the First Ontario Industrial Waste Conference, 1954, pp. 115-119, printed. Ontario

Industrial Waste Conference, Toronto, Ontario, Canada.

"Pollution of Streams and Fisheries," by Schweng, Water Pollution Abstracts, vol. 33, no. 9, 1960, Abst. No. 1886.

"The Problem of the Permissible Pollution Load on Flowing Waters," by F. Wachek, article, Zeitschrift für Fischerei und deren Hilfswissenschaften, vol. 8, no. 1/3, 1959, pp. 87-104, printed in German. Zeitschrift für Fischerei und deren Hilfswissenschaften, Neumann Verlag, 19 Dr. Schmincke Allee, Radebeul 1, Germany.

PRESERVATION:

"Preparation of a Coating Material by Chlorination of Fish. VII--Preparation of a Chlorination Product with High Melting Point," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, May 1960, pp. 508-513, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

PURSE SEINING:

"O Kompleksnoi Mekhanizatsii Koshel'kovogo Lova" (On Complex Mechanization of Purse Seining), by A. A. Romanov, article, Rybnoe Khoziaistvo, vol. 35, no. 1, 1959, pp. 42-49, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

QUALITY:

"Effect of Subfreezing on the Quality and Storage Life of Fish," by N. A. Golovkin and L. I. Pershina, article, Annex 1960-3 to Bulletin I. I. R., pp. 289-296, illus., printed in French and English. Institut International du Froid, 177 Boulevard Malesherbes, Paris XVII, France.

"Some Factors Affecting the Loss of Quality of Frozen Fish in Distribution," by D. L. Nicol and R. Spencer, article, Annex 1960-3 to Bulletin I. I. R., pp. 303-307, illus., printed in French and English. Institut International du Froid, 177 Boulevard Malesherbes, Paris XVII, France.

SALMON:

"The Appearance of Pink Salmon, Oncorhynchus gorbuscha (Walbaum), in Lake Superior," by Robert E. Schumacher and Samuel Eddy, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 371-373, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

"On the Chinook Salmon Eggs, Oncorhynchus tshawytscha (Walbaum), First Planted in Hokkaido, Japan," by Toyohiko Hikita, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 1-6, printed. Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Contribution to the Comparative Physiology and Genetics of the European Salmonidae. III--Temperature Resistance at Different Ages," by J. T. Spaas, article, Hydrobiologia, vol. 15, nos. 1/2, 1960, pp. 78-88, printed. Hydrobiologia, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"The Development of Salinity Tolerance in the Salmon, *Salmo salar* (L.) and Some Related Species," by Gwyneth Parry, article, Journal of Experimental Biology, vol. 37, no. 2, 1960, pp. 425-434, printed, Journal of Experimental Biology, Cambridge University Press, 200 Euston Rd., London NW1, England.

"Influence of Size upon the Adaptation of Steelhead Trout, *Salmo gairdneri*, and Chum Salmon, *Oncorhynchus keta* to Sea Water," by Arthur H. Houston, article, Journal of the Fisheries Research Board of Canada, vol. 48, no. 3, 1961, pp. 401-415, printed, Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Methods of Enumerating Salmon in Alaska," by Richard R. Straty, article, Transactions of the Twenty-Fifth North American Wildlife and Natural Resources Conference, 1960, pp. 286-297, printed, Wildlife Management Institute, Wire Bldg., Washington 5, D. C.

"Mortalities of Downstream Migrant Salmon at McNary Dam," by Dale E. Schoeneman, article, Transactions of the American Fisheries Society, vol. 90, no. 1, 1961, pp. 58-72, printed, Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

Progress Report to Pacific Northwest Power Company on the Development of Facilities for Passing Migrant Fish over High Dams, by Eldon R. Floodeen, 17 pp., illus., processed.

Racial Identification of Fraser River Sockeye Salmon by Means of Scales and Its Applications to Salmon Management, by Kenneth A. Henry, Bulletin XII, 100 pp., illus., printed, International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1961.

"Results from Marking Experiments on Young Chum Salmon in Hokkaido, 1951-1959," by Ei-ichi Sakano, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 17-38, printed, Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Salmon Canning--A Thriving Industry of the Canadian North West," by Elliot B. Dewberry, article, Food Manufacture, vol. 36, May 1961, pp. 185-191, printed, Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

"Selective Breeding of Chinook Salmon," by Lauren R. Donaldson and Deb Menasveta, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 160-164, printed, Librarian, Colorado A & M College, Fort Collins, Colo.

"Studies on the Kokanee Salmon. III--Fluctuations in Abundance of the Spawning Kokanee Salmon of Lake Shikotsu, Hokkaido, Japan," by Toshinobu Tokui, article, Scientific Reports of the Hokkaido Salmon Hatchery, no. 15, 1960, pp. 7-16, printed, Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Temperature Relationships in a Pink Salmon Stream in Alaska," by William L. Sheridan, article, Ecology, vol. 42, no. 1, 1961, pp. 91-98, printed, Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

SAURY:

"Lipides of Pacific Saury. I--Solvent Fractionation of Lipide of Pacific Saury," by Katsuo Nagakura and Noriko Kawasaki, Chemical Abstracts, vol. 55, 8690g, May 1, 1961.

SEA LAMPREY:

Distribution of Sea Lamprey *Ammocoetes* in Lake Michigan Tributaries of the Upper Peninsula of Michigan, 1955-1959, by Thomas M. Stauffer, Miscellaneous Publication No. 14, 19 pp., illus., printed, Michigan Department of Conservation, Institute for Fisheries Research, Ann Arbor, Mich., January 1961.

SEAWEED:

"More Food From Seaweed," article, Food Manufacture, vol. 36, June 1961, p. 225, printed, Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

SEROLOGY:

"Serological Criteria of Species," by F. J. O'Rourke, article, Irish Journal of Medical Science, no. 410, 1960, pp. 76-80, printed, Royal Academy of Medicine in Ireland, Cahill and Co., Ltd., Parkgate Printing Works, Dublin, Ireland.

SHAD:

"Natural Mortality of American Shad," by Charles H. Walburg, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 228-230, printed, Librarian, Colorado A & M College, Fort Collins, Colo.

SHARKS:

"Experimental Shark Pens at the Lerner Marine Laboratory," by Perry W. Gilbert and Henry Kritzler, article, Science, vol. 132, no. 3424, 1960, p. 424, printed, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

"The Investigation of Salmon Shark as a Predator on Salmon in the North Pacific," by Osamu Sano, article, Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 22, September 1960, pp. 68-82, printed, Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"A New Species of Sawshark, *Pristiophorus schroederi*, from the Bahamas," by Stewart Springer and Harvey R. Bullis, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 10, no. 2, 1960, pp. 241-254, printed, Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

"Notes on Western North Atlantic Sharks," by Richard H. Backus, article, Copeia, no. 3, 1960, pp. 243-245, printed, Copeia, American Society of Ichthyologists and Herpetologists, 1811 Nordhoff St., Northridge, Calif.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Observations on Sharks during Oceanographic Cruises," by Paul W. Hess, article, *Estuarine Bulletin*, vol. 6, nos. 3 and 4, December 1961, pp. 6-11, illus., printed. *Estuarine Bulletin*, University of Delaware, Department of Biological Sciences, Newark, Del. Discusses recent interest in sharks, evolution and occurrence of the shark, species observed during cruises, food-searching activity, an unprovoked shark attack, physical characteristics, reproduction, and distinguishing features.

SHELLFISH:

"Collaborative Studies of the Chemical Assay for Paralytic Shellfish Poison," by Earl F. McFarren and J. E. Campbell, article, *Journal of the Association of Official Agricultural Chemists*, vol. 44, May 1961, pp. 278-281, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Public Health Significance of Paralytic Shellfish Poison," by Earl F. McFarren and others. *Chemical Abstracts*, vol. 55, 9705a, May 15, 1961.

"Shellfish Poisoning--Another North American Ghost," by J. D. Medcof, article, *The Canadian Medical Association Journal*, vol. 82, January 9, 1960, pp. 87-90, printed. Canadian Medical Association, 105 St. George St., Toronto 5, Canada.

SHRIMP:

"The Bait Shrimp Fishery of Galveston Bay, Texas," by Edward Chin, article, *Transactions of the American Fisheries Society*, vol. 89, no. 2, 1960, pp. 135-141, printed. The American Fisheries Society, P. O. Box 429, McLean, Va.

SMELT:

"The Smelt Fishery of the Miramichi, 1960-61," by R. A. McKenzie, article, *Trade News*, vol. 14, nos. 5-6, November-December 1961, pp. 13-16, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Discusses smelt landings in the Miramichi River in recent years, the spring spawning runs, the Great Lakes smelt fishery, and a survey of smelt spawning conducted in 1961. Includes statistical tables showing smelt landings, 1946-1961.

SMOKED FISH:

"Phenolic Content of Smoked Fish," by A. I. Yuditskaya and T. M. Lebedeva. *Chemical Abstracts*, vol. 55, 11696a, June 12, 1961.

SOLE:

"The Stock of Soles (*Solea solea*) and the Sole Fishery on the Danish North Sea Coast," by Jorgen Moller Christensen, article, *Meddelelser Fra Danmarks Fiskeri- og Havundersogelser*, vol. 3, nos. 1-6, 1960-1961, pp. 19-63, printed in Danish. Fiskeriministeriets Forsogslaboratorium, 10 Oster Voldgade, Copenhagen, Denmark.

SOUTH AFRICA REPUBLIC:

Department of Nature Conservation, Report No. 17, 1960, 104 pp., illus., printed. Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. This report covers the activities of

the Department of Nature Conservation for 1960. It includes, among others, a section on the Division of Inland Fisheries which discusses the two Government hatcheries, stocking of public waters, tidal waters of the Cape, new type of pond for rearing trout, survey of dams in the northern Cape, comparison of the growth rate of 6 species of fish, and sale of angling licenses.

SOUTH-WEST AFRICA:

Shell in Industry (Special South West Africa Issue), no. 39, July/September 1961, 32 pp., illus., printed. Shell South Africa (Pty.) Ltd., P. O. Box 2231, Cape Town, South Africa Republic. Contains, among others, the following articles: "Four Million Pilchards a Day," "Big Money in Guano," and "Walvis Bay--Industrial Mushroom."

SPAIN:

"Comercio Exterior Pesquero en 1960" (Foreign Trade in Fishery Products in 1960), article, *Boletín de Informacion*, no. 37, October 1961, pp. 9-12, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, Madrid, Spain.

SPOT:

"Age and Growth of the Spot, *Leiostomus xanthurus* Lacepede," by Bangalore I. Sundararaj, article, *Tulane Studies in Zoology*, vol. 8, no. 2, October 28, 1960, pp. 41-62, illus., printed, 65 cents. Meade Natural History Library, c/o Department of Zoology, Tulane University, New Orleans 18, La.

STANDARDS:

"Biochemische Untersuchungen zur Frage der Aufstellung von Guteklassen bei Seefischen" (Biochemical Investigations into the Problem of Establishing Quality Standards for Seafishes), by F. Bramstedt and J. Wurzbacher, article, *Fette-Seifen-Anstrichmittel*, vol. 62, no. 6, 1960, pp. 513-517, printed in German. Fette-Seifen-Anstrichmittel, Industrieverlag von Hernhausen K. G., Hamburg 11, Germany.

What Consumers Should Know About Food Standards, Food and Drug Administration Publication No. 8, 12 pp., illus., printed, 15 cents. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C., 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses standards of identity and quality, etc. for foods and how the consumer depends on such standards; and how the Food and Drug Administration collects market samples in a ceaseless watch for products that are below standard. The booklet is illustrated with photographs showing some of the scientific tests FDA makes to check samples of food products against the standards.

STATISTICS:

"Use of Machine Methods in Processing Fishery Data," by Victor W. Lambow, article, *Proceedings of the Thirteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 116-120, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1959.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

STORAGE:

"British Study Effect of Various Factors on Storage of AFD Cod Steaks," article, Food Engineering, vol. 33, June 1961, p. 91, printed, Food Engineering, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

"Frozen Fish Storage," by W. J. Dyer, article, Annual Review and Program for the 14th Annual Meeting of the Fisheries Council of Canada, pp. 33, 35, printed, Fisheries Council of Canada, P. O. Box 547, Ottawa, Canada, 1959.

"The Storage of Sea-Products with Antibiotics and Irradiation," by P. Vidal, article, Revue Generale du Froid, vol. 38, no. 1, January 1961, pp. 14-16, printed in French, Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

STRIPED BASS:

Atlantic Coast Migration of Large Striped Bass as Evidenced by Fisheries and Tagging, by Robert B. Chapoton and James E. Sykes, 8 pp., illus., printed, (Reprinted from Transactions of the American Fisheries Society, vol. 90, no. 1, January 1961, pp. 13-20.) Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo. During studies of Atlantic Coast striped bass, Roccus saxatilis (Walbaum), by the U. S. Fish and Wildlife Service and cooperators from 1955 to 1959, 478 large fish ranging in weight from 6 to 54 pounds and in age from 3 to 18 years were tagged. Tagging locations were the North Carolina coast where 81 fish were tagged; Albemarle Sound and Roanoke River (N. C.) where 97 fish were tagged; and Chesapeake Bay and tributaries where 300 tags were applied. Catches by commercial and sport fisheries indicated that large striped bass concentrated on the coast of North Carolina in late fall and winter, on or near spawning areas for striped bass in North Carolina and Chesapeake Bay in late winter and spring, and along the coast north of Chesapeake Bay as far as Massachusetts in the summer and fall.

SWEDEN:

Organizational Work Amongst Swedish West Coast Fishermen, by Georg Aberg, 7 pp., printed, Handelstryckeriet, Goteborg, Sweden, 1959. Discusses how fishermen are organized, work of the Swedish West Coast Fishermen's Central Organization, co-operative fish marketing, price controls, and co-operative salting. Also covers fish processing, economic activities of the Organization, collaboration with other fishermen's organizations, cultural and publicity work, organizing study activities, and the future of the Organization.

TAGGING:

"An Electric Instrument for Brandmarking Fish," by Rom. Moav, article, Bamidgeh, vol. 12, no. 4, 1960, pp. 92-95, printed, Department of Fisheries and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel.

"Radioactive Iron as a Fish Mark," by D. P. Scott, article, Journal of the Fisheries Research Board

of Canada, vol. 18, no. 3, 1961, pp. 383-391, printed, Queen's Printer & Controller of Stationery, Ottawa, Can.

TARIFFS:

Tariff Classification Study, First Supplemental Report, (Report to the President and to the Chairmen of the Committee on Ways and Means of the House and the Committee on Finance of the Senate Pursuant to Title I of the Customs Simplification Act of 1954), 1,113 pp., illus., processed, \$6. United States Tariff Commission, Washington, D. C., January 1962. Embodies the changes in the headnotes and tariff schedules of the Tariff Classification Study, published November 15, 1960, which, in the judgment of the Commission, are necessary to bring them down to date, to correct error, or to further the objectives of the Study. The report also contains a full explanation of each proposed change as well as a statement of reasons for not accepting certain of the suggestions received from interested parties.

_____, Submitting Report, 89 pp., printed, 35 cents. November 15, 1960.

_____, Alphabetical Index of Commodities Provided for in the Proposed Revised Tariff Schedule of the United States, 130 pp., printed, 65 cents, May 20, 1961. Fishery products are among the commodities listed.

_____, Proposed Revised Tariff Schedules of the United States, 631 pp., processed, \$4.25, November 15, 1960. Includes fishery products.

_____, Explanatory and Background Materials. Schedule 1--Animal and Vegetable Products, 495 pp., printed, \$2.25, November 15, 1960. Includes a section on fish and shellfish.

_____, Explanatory and Background Materials. Schedule 2--Wood and Paper; Printed Matter, 309 pp., printed, \$1.50, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 3--Textile Fibers and Textile Products, 630 pp., printed, \$3.25, November 15, 1960. Contains a section pertaining to fishing nets.

_____, Explanatory and Background Materials. Schedule 4--Chemicals and Related Products, 473 pp., processed, \$2.25, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 5--Nonmetallic Minerals and Products, 416 pp., printed, \$2, November 15, 1960.

_____, Explanatory and Background Materials. Schedule 6--Metals and Metal Products, 916 pp., illus., processed, \$4.75, November 1960.

_____, Explanatory and Background Materials. Schedule 7--Specified Products; Miscellaneous and Nonenumerated Products, 909 pp., processed, \$5, November 15, 1960. Includes fishing tackle and pearls.

_____, Explanatory and Background Materials. Schedule 8--Special Classification Provisions Appendix to the Tariff Schedules, 186 pp., processed, \$1,

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November 15, 1960. (Note: All of these Tariff reports are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at the prices indicated for each volume.)

TILAPIA:

"Adaptability of *Tilapia nilotica* to Various Saline Conditions," by Ruth Lotan, article, *Bamidgeh*, vol. 12, no. 4, 1960, pp. 96-100, printed. Department of Fisheries and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel.

"The Culture of *Tilapia nigra* (Gunther) in Ponds. II--The Influence of Water Depth and Turbidity on the Growth of Male *T. nigra*; III--The Early Growth of Males and Females at Comparable Stocking Rates, and the Length/Weight Relationship," by Vernon D. van Someren and Peter J. Whitehead, articles, *East African Agricultural Journal*, vol. 25, no. 2, 1959, pp. 66-72; vol. 25, no. 3, 1960, pp. 169-173, respectively, printed. East African Agricultural Journal, Government Printer, Nairobi, Kenya.

"Laboratory Experiments on the Growth of *Tilapia* Spp. I--The Value of Various Foods," by C. C. Cridland, article, *Hydrobiologia*, vol. 15, nos. 1/2, 1960, pp. 135-160, printed. *Hydrobiologia*, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

TRANSPORTATION:

"Conditions for Use of Aeroplanes for the Transport of Perishable Foodstuffs," article, *Bulletin de L'Institut International du Froid*, vol. 41, no. 1, 1961, pp. 302-308, printed. International Institute of Refrigeration, 177 Blvd. Malesherbes, Paris 17, France.

TRAWLER-FREEZER:

"La Congelation du Poisson sur l'Automne Sun, Chalutier Anglais de 33.5M." (Freezing of Fish Aboard the 33.5-M. English Trawler, Autumn Sun), article, *La Pêche Maritime*, vol. 39, no. 984, 1960, pp. 153-155, illus., printed in French. *La Pêche Maritime*, 190, Boulevard Haussmann, Paris, France.

"The MFV Autumn Sun - Freezer-Trawler," by R. E. Adams, article, *Journal of Refrigeration*, vol. 3, no. 3, 1960, pp. 59-62, illus., printed. *Journal of Refrigeration*, Foxlow Publications Ltd., 19 Harcourt St., London W1, England.

"The Smallest Trawler-Freezer in the World," article, *Modern Refrigeration*, vol. 63, no. 744, 1960, pp. 267-269, illus., printed. *Modern Refrigeration*, Refrigeration Press Ltd., Maclaren House, Great Suffolk St., London SE1, England.

TRAWLERS:

"Development of a New Stern Trawler," by J. Venus, article, *The Motor Ship*, vol. 40, no. 474, 1960, pp. 376-378, illus., printed. *The Motor Ship*, Temple Press Ltd., Bowling Green Lane, London EC4, England.

"A New German High-Seas Trawler," by H. Ofterdinger, article, *Die Kalte*, vol. 14, no. 1, January 1961, pp. 20-21, printed in German. *Die Kalte*, Hans A. Keune Verlag, Pressehaus, 1 Speersport, Hamburg 1, Germany.

"The Stern Trawler *Universal Star*," article, *Ship and Boat Builder*, vol. 13, no. 17, 1960, pp. 254-255, illus., printed. *Ship and Boat Builder*, John Trundell Ltd., St. Richards House, Eversholt St., London NW1, England.

"*Universal Star*, Chalutier de 31 Metres, Equipe pour la Pêche par l'Arrière" (*Universal Star*, a 31-M. Vessel for Stern Trawling), article, *La Pêche Maritime*, vol. 39, no. 983, 1960, pp. 106-107, 109, illus., printed in French. *La Pêche Maritime*, 190 Boulevard Haussmann, Paris, France.

TRAWLING:

"New Type Otter-Boards for Mid-Water Trawl," by Kichio Kobayashi and Navichi Inoue, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, May 1960, pp. 20-21, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Trawl Fishing in the Tropical Atlantic," by R. H. Lowe and Alan R. Longhurst, article, *Nature*, vol. 192, no. 4803, November 18, 1961, pp. 620-621, printed, 2s. 6d. (about 40 U. S. cents). *Nature*, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y. Discusses exploratory trawling operations in the western and eastern South Atlantic by the Colonial Office vessel, *Cape St. Mary*. Covers catch rates and composition, analysis of findings, and details of vessel construction.

"Trawling . . . a New Development in the Pennsylvania Commercial Fisheries of Lake Erie," by Alfred Larsen, article, *Pennsylvania Angler*, vol. 31, no. 1, January 1962, pp. 3-7, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. According to the author, "Recent trends in the Pennsylvania commercial fisheries have been toward a steady decline in availability of such choice fish as blue pike and whitefish and an increase in the less desirable species such as smelt, gizzard shad, and alewives." The recent introduction of trawling for smelt in the Great Lakes by the U. S. Bureau of Commercial Fisheries may be an answer to the present economic plight of all Lake Erie commercial fishermen. This article discusses recent exploratory fishing cruises for smelt in Lake Erie, operation of the trawl, handling of the fish after capture, processing of the fish, and opportunities for future development of the smelt fishery.

TROUT:

"Hepatoma (Liver Ailment Sparks Vast Research)," and "A Progress Report on Hepatoma," by Howard A. Tanner, articles, *U. S. Trout News*, vol. 6, no. 4, November-December 1961, pp. 4-5, 21-22, illus., printed. U. S. Trout Farmers Association, 110 Social Hall Ave., Salt Lake City 11, Utah. Discusses the occurrence and probable causes of trout hepatoma, or cancer of the liver, and programs initiated by various Federal and state agencies for its control. This costly disease, in the opinion of researchers, is probably caused by some element in the diet.

"Night Use of a Direct-Current Electric Shocker to Collect Trout in Lakes," by William C. Latta and Gerald F. Myers, article, *Transactions of the American Fisheries Society*, vol. 90, no. 1, 1961, pp. 81-83, printed. *Transactions of the American Fisheries*

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Society, Librarian, Colorado A & M College, Fort Collins, Colo.

TUNA:

"Bestimmung des Altersaufbaues des Roten Thunes (*Thunnus thynnus* (Linnaeus)) in der Nordsee mit Hilfe des Allometrischen Wachstums der Augenhöhle" (Determination of Age in the Red Tuna (*Thunnus thynnus* (Linnaeus)) in the North Sea by the Allometric Growth of the Eye Socket), by Klaus Tiews, article, Archiv für Fischereiwissenschaft, vol. 11, no. 1, 1960, pp. 11-17, printed in German. Bundesforschungsanstalt für Fischerei, Hamburg, Germany.

The Migration, Age, and Growth of Pacific Albacore (*THUNNUS GERM*), 1951-1958, by Harold B. Clemens, Fish Bulletin No. 115, 125 pp., illus., printed, California Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif., 1961. During January 1952, marine biologists developed the first successful tuna tag. It resembles a piece of spaghetti and has been employed as a research tool for studying the populations of important tuna species. Using these tags, scientists discovered that albacore migrate northward up the west American coast averaging at least 6 nautical miles per day; that they perform a transpacific migration between the American mainland and the Hawaiian Islands and Japan; that their growth rate is relatively rapid, averaging 7 pounds per year for the catch-dominating 13-pound fish; that the natural size groups in the fishery are successive year classes; that individuals and perhaps the same schools return to the American fishing grounds during several seasons; and that there is but one population in the North Pacific. Scientists have also determined the ages of albacore by studying rings on the scales; have obtained valuable data on the time and place of albacore spawning; and have determined their size at maturity. Data obtained from research cruises and specially designed fishermen's logbooks disclosed that albacore abundance is greatest where sea-surface temperatures are 60°-68° F. This information led to discovery of the albacore coastward migration routes and the successful prediction of vast migration route changes in 1958, 1959, and 1960.

"Studies on the Fluctuation in Catch of the Tuna-Fishing Fleet. II--On the Latitudinal Change of the Hooked-Rate of the Albacore and the Striped Marlin in the Fiji Area; III--On the Stomach Contents of Tuna in the Western South Pacific Ocean, Especially in the Fiji Area," by Sigeiyuki Koga, article, Bulletin of the Faculty of Fisheries, Nagasaki University, no. 9, 1960, pp. 1-17, printed. Faculty of Fisheries, Nagasaki University, Nagasaki, Japan.

TURKEY:

Balık ve Balıkçılık (Fish and Fishery), vol. 9, no. 11-12, November-December 1961, 28 pp., illus., printed in Turkish with English table of contents. Balıkçılık Mudurluğu, Besiktas, Istanbul, Turkey. Includes, among others, the following articles: "Manufacturing of Anchovies of Different Types;" "Tortoisés (Testudénata);" and "The Characteristics and Standardization of Sea Origin Oils."

"Gıda - Nüfus Meselelerimiz" (Our Nutrition and Population Problems), by Süleyman Arısoy, article, Türkiye İktisat Gazetesi, no. 433, 1961, p. 5, printed in Turkish. Türkiye İktisat Gazetesi, Posta Kutusu 397, Ankara, Turkey.

"Türkiye'nin Gıda Problemi Hakkında 'Baade Raporu' Üzerinde Düşünceler" (A Thought on Baade's Report in Relation to the Nutrition Problems of Turkey), by Süleyman Arısoy, article, Türkiye İktisat Gazetesi, no. 400, 1960, p. 5, printed in Turkish. Türkiye İktisat Gazetesi, Posta Kutusu 397, Ankara, Turkey.

TURTLES:

Maryland Turtles, by Frank J. Schwartz, Educational Series No. 50, 42 pp., illus., printed. Maryland Department of Research and Education, Solomons, Md., May 1, 1961. Discusses the general anatomy and habits of turtles and describes in detail 18 species of turtles found in Maryland. Includes a table showing the volume and value of terrapin and snapper turtles, by gear, captured in Maryland, 1957 and 1958.

UNDERWATER CAMERA:

"A Pressurizing Device for a Camera Case Designed for Use in Shallow Water," by D. J. Scarratt, article, Journal of the Marine Biological Association of the United Kingdom, vol. 41, no. 1, 1961, pp. 77-80, printed. Journal of the Marine Biological Association of the United Kingdom, Cambridge University Press, 200 Euston Rd., London, NW1, England.

U.S.S.R.:

"The Fishing Fleet of the Soviet Union," by Bernard M. Kassell, article, U. S. Naval Institute Proceedings, vol. 87, no. 11, November 1961, pp. 70-81, illus., printed. U. S. Naval Institute, Annapolis, Md. Describes the problem posed for the western world by the growth of Soviet high-seas fisheries. This seems to be a two-pronged problem--one economic and the other strategic. Increased catches by the Soviet wide-ranging fleets are expected to result in decreasing markets for such fish-exporting nations as Iceland. Of strategic concern are the 200 to 400 trawlers and other large Soviet vessels fishing the year round in Atlantic and Pacific waters near the coasts of North America. Plans call for the continued growth of the ocean-going fleet, including the building of 68 factoryships with freezer installations and 47 refrigerated transport ships. In addition, 26 base ships or floating canneries are to be obtained. The majority of the fleet, however, will continue to be comprised of trawlers and seiners.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE FISHERIES RESEARCH BOARD OF CANADA, BIOLOGICAL STATION, ST. ANDREWS, N. B., CANADA.

Development of Methods for Distinguishing Different

Kinds of Fishes on Echograms, by A. A. Lovetskaya, V. P. Oviannikov, and N. I. Chugunova, Translation Series No. 255, 8 pp., processed, 1960. (Translated from Russian, Voprosy Ikhtologii, no. 7, 1956, pp. 139-148.)

A First Attempt at Using a Submarine for Observations on the Behaviour of Herring, by D. V. Radakov

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

and B. S. Solovov, Translation Series No. 338, 6 pp., processed, 1961. (Translated from Russian, Rybnoe Khoziaistvo, vol. 35, no. 7, 1959, pp. 16-21.)

Quantitative Study of the Baltic Herring Eggs and Larvae in the Northern Part of the Gulf of Riga and Principal Factors Determining Their Survival, by L. A. Rannak, Translation Series No. 238, 15 pp., processed, 1959. (Translated from Russian, Trudy Vsesoiuznogo Nauchno-Issledovatel'skogo Instituta Morskovo Rybnogo Khoziaistva i Okeanografii (VNIRO), vol. 34, 1958, pp. 7-18.)

Submarine Research Expeditions of the SEVERIANKA, by V. P. Zaitsev and V. G. Azhazha, Translation Series No. 339, 7 pp., processed, 1961. (Translated from Russian, Rybnoe Khoziaistvo, vol. 35, no. 7, 1959, pp. 7-16.)

VENEZUELA:

"La Pesca de Esperanza de Venezuela" (Venezuela's Fishery of the Future), by C. R. Chavez, article, El Agricultor Venezolano, vol. 23, no. 216, 1960, pp. 29-31, printed in Spanish. El Agricultor Venezolano, Ministerio de Agricultura y Cria, Caracas, Venezuela.

VESSELS:

Oceanographic Vessels of the World, 700 pp., illus., processed, \$4.50, limited distribution. U. S. Navy Hydrographic Office, Washington 25, D. C., 1961. Describes the oceanographic vessels of the world, giving in detail their specifications, their equipment, and their scientific capabilities. Presents details of construction, performance, personnel, propulsion, electrical power, navigation, communication, and echo-sounding equipment, laboratories, habitability, and type of observation. Oceanographic vessels of 66 countries are covered.

VIRGINIA:

Sixty-Second and Sixty-Third Annual Reports of the Commission of Fisheries of Virginia (For the Fiscal Years Ending June 30, 1960, and June 30, 1961), 66 pp., illus., printed. Commission of Fisheries, Newport News, Va. A report showing the amount of revenue derived from the fish and shellfish industries, all the expenditures of the Commission, and the general condition of the fish and shellfish industries under the supervision of the Commission. Statistical tables and reports are included as follows: receipts from fish and shellfish industries; expenditures for administration, enforcement, and restocking work; list of recorded oyster planting ground; areas in which restocking was done; and comparative statements of expense for the past ten years. Includes reports covering the shad-hatching work on the Mattaponi and Pamunkey Rivers for 1960 and 1961. Because of the poor runs of shad, the hatchery on the Chickahominy River again did not operate during the period covered. A report of the Virginia Fisheries Laboratory, Gloucester Point, describes its activities, with special reference to investigations of oysters and oyster drills, blue crab, migratory fish, and the pollution problem.

VITAMIN A:

"Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. II--The Es-

terification of Alcohol Concentrate and Stability Tests," by Hideo Higashi and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, July 1959, pp. 196-203, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori, 6-Chome, Tokyo, Japan.

"Vitamin A Extracts," by R. Matheron, Chemical Abstracts, vol. 52, 665, January 10, 1958.

WATER SAMPLING:

"A Newly Designed Apparatus for Water Sampling at Shallow Depths," by Charles Gairnor, article, Ecology, vol. 41, no. 4, 1960, pp. 794-797, printed. Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

WHALING:

"International Whaling Commission," by G. R. Clark, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 50, no. 10, October 1961, pp. 411-424, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. Comprises the Chairman's Report from the 13th Meeting of the International Whaling Commission, held at London, June 19-23, 1961. Reports on condition of the stocks, the Convention's conservation aims and extra-Convention discussions, the carry-over of Antarctic pelagic whaling quotas, opening date of Antarctic baleen whaling season, and observer plan. Also discusses Antarctic catch limitation, scientific appraisal of Antarctic whale stocks, review of previous season's catch, study of North Pacific stocks, size limits for sperm whales, minimum size of whales to be taken at land stations in Northeast Pacific area, protection of humpbacks, and Greenland whaling. Other subjects covered include humane killing of whales, infractions of regulations, implementing legislation, finances, and representation at meetings of other organizations.

"Statement from The Federation of Norwegian Whaling Companies," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 50, no. 11, November 1961, pp. 447-452, illus., printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

WHITEFISH:

"Age and Growth of the Whitefish, Coregonus clupeaformis, of Munising Bay, Lake Superior," by Thomas A. Edsall, article, Transactions of the American Fisheries Society, vol. 89, no. 4, 1960, pp. 323-332, printed. Transactions of the American Fisheries Society, Librarian, Colorado A & M College, Fort Collins, Colo.

WHITING:

"Growth and Feeding Habits of the Whiting or Silver Hake in the New York Bight," by Richard H. Schaefer, article, New York Fish and Game Journal, vol. 7, no. 2, 1960, pp. 85-98, printed. New York Fish and Game Journal, New York Conservation Dept., Albany 1, N. Y.

WORLD TRADE:

The following World Trade Information Service Reports, published by the Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C., are for sale by the Superintendent of Documents,

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U. S. Government Printing Office, Washington 25, D. C., at 10 cents a copy.

Food Regulations of Panama, Operations Report No. 61-77, WTIS Part 2, 4 pp., printed, November 1961.

Import Tariff System of Argentina, Operations Report No. 61-82, WTIS Part 2, 2 pp., printed, November 1961.

YELLOW PIKE:

"Age and Growth of Wall-Eyes in Clear Lake, Iowa, 1935-1957," by Kenneth D. Carlander and Richard R. Whitney, article, Transactions of the American Fisheries Society, vol. 90, no. 2, 1961, pp. 130-138 printed. Librarian, Colorado A & M College, Fort Collins, Colo.



PARTY SHRIMP PLATE



2 pounds cooked, peeled, de-veined shrimp, fresh or frozen

2 large cucumbers, sliced
Lettuce

Thaw frozen shrimp. Arrange shrimp on crisp lettuce with cucumber slices. Serve with Party Shrimp Sauce. Yield: about 100 shrimp.

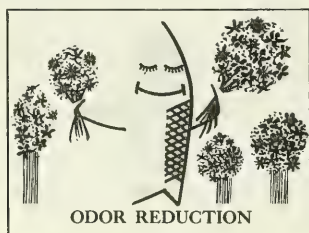
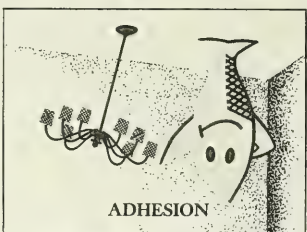
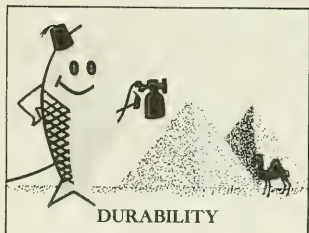
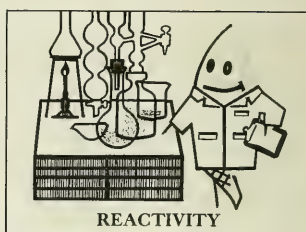
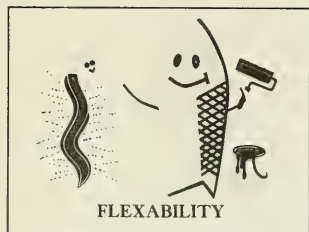
PARTY SHRIMP SAUCE

2 cups sour cream
2 tablespoons horse-radish

1 teaspoon salt
1 teaspoon paprika

2 tablespoons grated onion

Combine all ingredients and blend well.



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Fishes

COMMERCIAL FISHERIES REVIEW



DL 24, NO. 4

APRIL 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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MACHINES SOLVE HANDLING PROBLEMS IN OYSTER PLANTS

By Charles F. Lee* and F. Bruce Sanford**

INTRODUCTION

This article shows three handling machines: a shellstock stock conveyor, a bulk-handling conveyor, and a forklift.

SHELLSTOCK CONVEYOR

Anyone who visits a plant for shucking oysters soon realizes that to produce a substantial volume of oysters, an oysterman must unload and move to storage and then to shuckers' benches a large quantity of live oysters in the shell or "shellstock" as it is known to the oysterman. Depending on the yield and the amount of empty shell present, 1 to 2½ bushels of shellstock must be shucked to obtain 1 gallon of oysters.

Some of the largest oyster plants have traveling-crane hoists to carry shellstock to bins over the shucking benches. In smaller plants, the problem of getting an adequate supply of shellstock to each shucker when he wants it and where he wants it has not lent itself to ready solution by mechanization. Shuckers work at widely different rates and often are scattered randomly among the shucking stalls when, as is normal, the plant is operating at less than peak capacity. Thus most plants still use men working with a wheelbarrow and shovel, or carts with wire baskets also filled by shovel. In New Orleans, La., the shellstock comes in to the plant in bags and the bags are emptied on the shucking bench. Each of these systems involves heavy manual labor.

One oysterman has found a novel solution to this problem. Figures 1 to 4 show how he does it.



Fig. 1 - An overhead conveyor track carries the "cars," filled with shellstock, on an endless chain to the shuckers' tables.

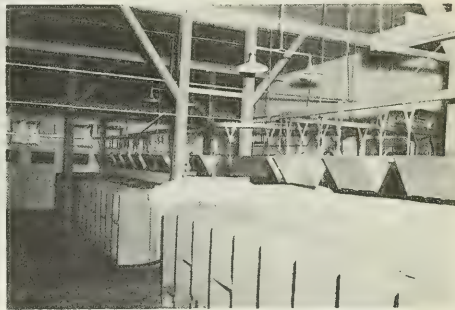


Fig. 2 - The V-shaped containers slowly pass in front of the shuckers. Whenever a shucker needs oysters, a light pull on the handle dumps the car contents on the bench.

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Fig. 3 - This is the device used for loading the cars. A tractor-mounted scoop fills the hopper, and the shell oysters drop by gravity into the trough when the operator pulls the lever.

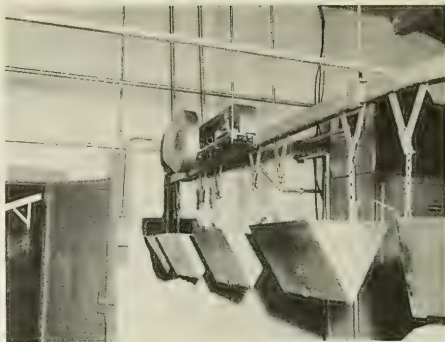


Fig. 4 - A small motor, mounted directly on the track, furnishes the driving power.

BULK-HANDLING CONVEYOR

Another conveyor that has proved useful in this plant is a self-propelled conveyor loader (fig. 5) for loading shellstock into trucks or for loading empty shell onto barges.



Fig. 5 - The bucket-loading conveyor is on a halftrack, is self-propelled, and includes a small lifting boom located on top. The commoner type of portable loader, seen in the right background, is mounted on large wheels and is moved by manpower.

FORKLIFT

The operator of this plant had another material-moving problem that he solved with ingenuity. The problem was to design a forklift that could be attached to a small tractor and powered by the hydraulic cylinders that normally lifted the scoop. One requirement was that the fork be maintained in a horizontal position, regardless of the height to which the fork was lifted. In solving this problem, he first made a small model with cardboard, matches, wire, and glue. After he worked out the required shape of lever and frame, he had a shop make the equipment in heavy steel. The trick was in getting the shape just right for the lever that slides over the "hump" (fig. 8) so that the load comes up evenly all the way and does not tip forward or slide backward at any point. Figures 6 to 11 show the detail.

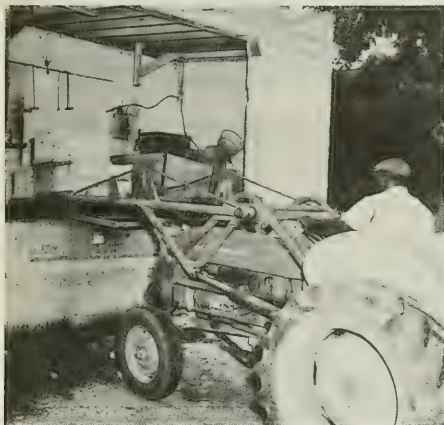


Fig. 6 - The tractor-mounted forklift will rise to a height adequate to place a load on the platform of the cold-storage building.



Fig. 8 - The lever (center) that positions the platform during the lift has a unique shape. This lever slides over the "nose" on the forward edge of the mounting frame.

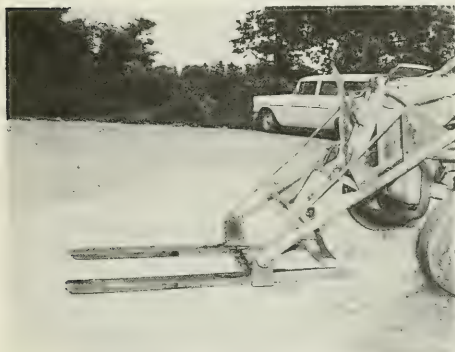


Fig. 7 - The fork lies perfectly flat at floor level.

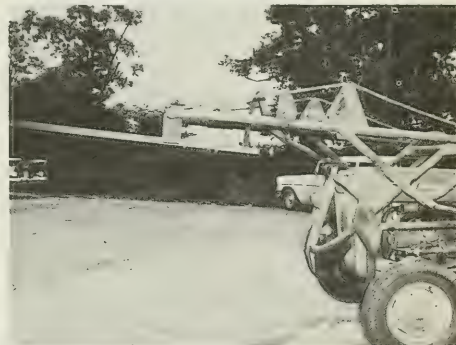


Fig. 9 - Shown from another angle is the relative position of the framework when the fork is raised.



Fig. 10 - Here is seen the positioning lever in the elevated position. The shape, angle, and length were found by trial and error with models.

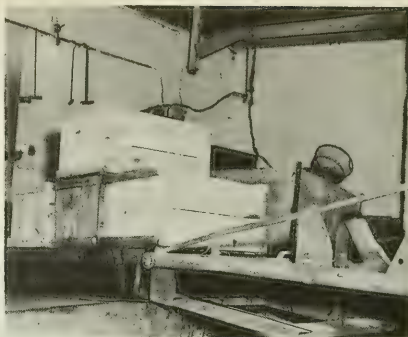


Fig. 11 - Four boxes of iced oysters are being delivered at the loading platform. Because of the unique design of the forklift, the fork can be lifted from ground level to maximum height while continuously maintaining the pallet in the horizontal position.

Note: The authors gratefully acknowledge the cooperation of Messrs. Cranston and Raymond Morgan, W. F. Morgan and Sons, Inc., Weems, Va., in the preparation of this report.



SEAFOOD AND EGGS MAKE GOOD MAIN DISH FOR FAMILY MEAL

A combination of seafood and eggs will make a nutritious, delightful, and moderately-priced main dish for the family table. Both seafood and eggs are excellent sources of the protein so necessary for the repairing and rebuilding of body tissues.

The home economists of the Bureau of Commercial Fisheries suggest the following recipe containing seafood and eggs.

SCALLOPS LORRAINE

1 pound scallops, fresh or frozen	2 tablespoons sherry
1 quart boiling water	2 tablespoons chopped parsley
2 tablespoons salt	1 teaspoon salt
1 cup pastry mix	1/2 teaspoon celery salt
3 eggs, beaten	Dash pepper
3/4 cup coffee cream	Paprika

Thaw frozen scallops. Remove any shell particles and wash. Place in boiling salted water. Cover and return to the boiling point. Simmer for 3 to 4 minutes, depending on size. Drain. Chop scallops. Prepare pastry mix as directed. Roll and line a 9-inch pie pan. Combine eggs and cream; add remaining ingredients except paprika. Place scallop mixture in pie shell. Sprinkle with paprika. Bake in a moderate oven, 350° F., for 35 to 40 minutes or until pie is firm in the center. Serves 6.

EFFECT OF BUTYLATED HYDROXY TOLUENE AND POTASSIUM SORBATE ON DEVELOPMENT OF RANCIDITY IN SMOKED MULLET

By Mary H. Thompson*

ABSTRACT

Mullet fillets were smoked and divided into groups according to the type of brine solution used: (1) 10-percent brine, (2) 0.1-percent butylated hydroxy toluene in 10-percent brine, (3) 1.0-percent potassium sorbate in 10-percent brine, and (4) 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate in 10-percent brine. The fillets were stored at 37° F. and were analyzed for the development of rancidity at intervals of 2 weeks.

Butylated hydroxy toluene gave the longest protection against rancidity. Potassium sorbate, however, protected the fillets against rancidity throughout the marketable life of the smoked product.

INTRODUCTION

Preservation of fishery products by smoking is a method that has long been in use, but in these days of modern refrigeration, smoke preservation is being used less extensively. More consumers, however, are becoming aware of the delicious taste of smoked fish. Many species of fish and shellfish are smoked and distributed today, but because of the short shelf life of these products, distribution is often restricted to those areas near the source of the material. The major problem--that of short shelf life--is due to two causes: (1) the rapidity with which this type of product develops surface molds and (2) the rapidity with which it develops rancid flavors.

To solve the first difficulty, that of mold development, researchers have tried various mold inhibitors. The use of potassium and sodium sorbate in extending the shelf life of smoked fish has been investigated by Geminder (1959). The use of potassium sorbate on smoked mullet fillets has been further investigated, at this laboratory, by Waters (1960). In both studies, it was found that potassium sorbate was effective in preventing mold deterioration of smoked fishery products.

The next problem was that of rancidity. The constituents of smoke have been shown to have an antioxidant effect on fatty fish fillets (Erdman, Watts, and Elias, 1954). Rancid flavors become evident in smoked mullet in a short time, however, effectively keeping the shelf life of this product short. The retardation of the development of rancidity in fresh frozen mullet has been studied in detail by Saenz and Dubrow (1959), who found that the shelf life of frozen vacuum-packed mullet fillets could be extended 4 to 5 months through proper application of antioxidant.



Fig. 1 - Chemist analyzing smoked mullet fillets for rancidity by the thiobarbituric acid method.

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To determine further the effects on rancidity development of the antioxidant and antimycotic and a combination of both as used in previous experiments concerned with mold spoilage (Waters 1960), techniques found in the literature were applied to smoked mullet. This report will describe the effects of butylated hydroxy toluene, potassium sorbate, and a combination of both on rancidity in smoked mullet fillets.

EXPERIMENTAL PROCEDURE

A large lot of mullet (*Mugil cephalus*) was obtained from a local seafood concern. These mullet had been caught in Bregon Sound, Miss., iced, and processed within 24 hours.

PROCESSING METHODS: The mullet were scaled and eviscerated. They were then randomly divided into four groups according to the type of brine to be employed. The brines used were as follows:

- (1) Control--10-percent brine.
- (2) Butylated hydroxy toluene--0.1-percent butylated hydroxy toluene in 10-percent brine.
- (3) Potassium sorbate--1.0-percent potassium sorbate in 10-percent brine.
- (4) Butylated hydroxy toluene and potassium sorbate--0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate in 10-percent brine.

The effective concentration of butylated hydroxy toluene and potassium sorbate had been previously determined by Waters (1960). The fillets were allowed to remain in the brine for 30 minutes at room temperature (75° F.). They were then removed from the solution and drained. Six fish from each group were removed and dried in an oven as a negative control for use in determining the amount of added TBA color development, if any, contributed by substances in the brining process. The remainder of the fish were smoked according to the procedure developed in this laboratory and previously recorded by Waters (1960). After being smoked, the fish were vacuum-packed in "cryovac" bags and stored at 37° F. The following day, six fish from each group were removed from the 37° F. room and analyzed as positive controls to determine TBA color development contributed by substances in the smoking process. Samples of six fillets of each group were removed at intervals of 2 weeks for analysis.

CHEMICAL METHODS: A butterfly fillet of mullet was ground three times in a General food grinder and a 1-gram sample was removed and analyzed for rancidity according to the thiobarbituric acid method (Yu and Sinnhuber 1957; Sinnhuber and Yu 1958). The amount of aldehyde produced during the rancidification of oils, as measured by the formation of a red color through the reaction of malonaldehyde with thiobarbituric acid, has been used as a measure of rancidity by these authors. $E_{1\text{cm}}^{1\%}$ at 535 mmu. was measured in a Bausch and Lomb "Spectronic 20" colorimeter. The factor for conversion of absorbancy to rancidity value (TBA value) was determined for this colorimeter with 1,1,3,3-tetraethoxypropane standard solution. A factor of 57 was found; in other words, an absorbance of 1.0 indicated 57 milligrams of aldehyde per 1,000 gram sample.

Each individual sample was analyzed for moisture and oil. Moisture was determined according to the method of the Association of Official Agricultural Chemists (1955) for fishery products, with the exception that Ottawa sand was used instead of asbestos. The AOAC (1955) acid hydrolysis method of oil analysis was employed.

ORGANOLEPTIC TESTS: Limited organoleptic tests were also used to indicate progress towards rancidity. The following classifications were employed: good--prime quality; fair--smoky flavor still discernible; rancid--rancid-oil flavor definitely noticeable. Fillets that were rated good or fair did not have a discernible rancid flavor, and these classifications merely serve to indicate progressive loss of smoky flavor. Fillets that were rated rancid ranged from those fillets with a barely discernible rancid flavor to those with a distinct rancid flavor.

RESULTS

The moisture content of the fish fillets ranged from 43.5 percent to 79.4 percent and averaged 60.8 percent. Since the TBA value is based upon the amount of color produced by a 1,000-gram sample of nondried material and since the fillets vary widely in moisture content, it becomes necessary to correct the TBA values either to the average moisture content of the fillets or to a dry-weight basis for comparison purposes; therefore, the TBA values corrected to 60.8-percent moisture are shown in table 1. The oil content of the fillets ranged

Table 1 - TBA Value, Oil and Moisture Content of Smoked Mullet Fillets Stored at 37° F. for 12 Weeks

Table 1 – TBA Value, Oil and Moisture Content of Smoked Mullet Fillets Stored at 37° F. for 12 Weeks																					
Type of brine solution		Negative Control (0 weeks)						Positive Control (0 weeks)						Period 1 (2 weeks)				Period 2 (4 weeks)			
		Moisture		Oil		Ratio	Moisture	Moisture		Oil		Ratio	Moisture	Moisture		Oil		Ratio	Moisture		
		TBA/	value	TBA/	value			TBA/	value	TBA/	value			TBA/	value	TBA/	value			TBA/	value
		..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	
10 percent brine	1	0.4	-	2.6	27.6	0.1	4.1	3.5	82.4	2.6	24.0	5.9	2.8	62.8	8.3	7.6	9.4	6.3	59.3	11.0	5.4
	2	0.2	-	4.8	24.9	0.2	4.1	3.5	88.2	3.5	16.6	6.6	3.5	58.7	7.7	7.6	12.5	9.4	63.4	3.3	19.2
	3	1.6	-	7.1	31.2	0.2	2.5	1.9	61.6	4.4	14.0	7.3	4.4	60.6	7.1	8.5	10.6	6.5	79.2	7.8	7.4
	4	0.2	-	2.6	24.6	0.1	3.0	2.4	60.6	3.5	17.5	7.0	3.9	60.0	7.1	8.5	9.6	6.5	64.0	4.2	15.2
	5	0.8	-	6.8	26.4	0.3	1.9	1.3	63.5	3.2	19.8	9.9	6.8	60.0	7.0	8.6	9.6	6.5	61.6	7.4	8.1
	6	0.4	-	3.6	24.6	0.2	1.9	1.3	58.0	4.0	14.5	8.6	5.5	61.7	8.4	7.3	10.7	7.6	64.4	9.9	7.4
Average		0.6	-	4.6	26.6	-	2.9	2.3	60.7	3.5	-	7.6	4.5	60.7	7.4	-	10.4	7.3	59.0	7.0	7.4
0.1 percent HRT/and 1.0 percent sorbate in 10 percent brine	1	2.1	-	19.2	18.3	0.1	2.9	1.4	64.4	9.0	7.2	5.8	1.8	62.0	6.1	7.7	4.8	0.8	62.8	5.5	11.4
	2	1.2	-	12.7	21.4	0.1	2.3	0.9	64.5	4.6	14.0	6.7	2.7	60.6	6.9	6.1	6.8	2.8	61.2	7.9	7.7
	3	0.8	-	12.2	21.7	0.6	3.4	1.9	60.9	8.9	6.8	4.9	0.9	59.6	11.0	5.4	10.6	6.6	60.4	8.2	10.8
	4	1.1	-	15.4	24.1	0.6	4.9	3.4	67.4	5.6	12.0	4.7	0.7	61.6	7.5	8.2	10.0	6.0	60.4	8.8	6.9
	5	1.8	-	15.6	19.3	0.8	2.4	0.9	64.0	5.0	12.8	6.5	2.5	58.3	6.1	9.6	6.4	2.4	61.9	6.0	10.3
	6	1.7	-	20.1	22.2	0.9	1.5	0.0	64.2	4.4	14.6	4.7	0.7	62.7	5.2	12.1	8.9	4.9	79.4	9.5	8.4
Average		1.5	-	17.4	21.2	-	2.9	1.4	64.2	6.3	-	5.6	1.6	60.8	8.0	-	7.9	3.9	64.3	7.9	-
1.0 percent potassium sorbate in 10 percent brine	1	0.3	-	1.8	28.8	0.1	4.3	3.6	61.0	7.5	8.1	5.1	1.9	55.1	9.3	5.9	6.9	5.7	65.9	3.1	21.3
	2	1.7	-	12.7	26.7	0.5	5.1	2.4	64.1	2.9	22.1	6.9	3.7	56.6	6.5	9.0	7.5	4.5	61.4	7.1	8.6
	3	0.5	-	2.5	17.4	0.1	5.1	4.8	61.0	3.9	15.6	6.5	2.1	61.7	5.5	17.6	6.8	3.6	56.1	6.4	8.6
	4	0.2	-	2.7	22.0	0.1	4.5	3.8	67.9	5.7	11.9	6.0	2.8	63.6	5.7	11.2	8.4	5.2	59.6	6.4	11.0
	5	1.4	-	19.4	25.6	0.8	5.0	4.5	60.0	8.4	7.1	5.6	2.4	59.3	6.3	9.4	5.7	2.5	56.9	5.9	9.6
	6	0.2	-	2.6	29.8	0.3	3.9	3.2	67.7	5.7	15.1	5.1	1.9	59.1	6.7	8.8	6.5	3.3	64.2	3.2	20.1
Average		0.7	-	6.9	24.6	-	4.3	3.6	62.1	5.0	-	5.7	2.5	59.2	6.5	-	7.0	3.8	60.7	5.2	-
0.1 percent HRT/and 1.0 percent sorbate in 10 percent brine	1	0.9	-	5.8	24.3	0.2	3.5	2.4	58.0	6.0	9.7	5.0	1.6	60.0	5.9	10.2	8.1	4.7	79.0	7.7	10.3
	2	0.9	-	6.3	29.5	0.2	4.0	3.1	60.9	5.4	11.5	5.0	1.6	57.5	6.9	8.5	9.3	5.9	61.3	5.3	11.6
	3	0.5	-	3.1	31.4	0.1	2.8	1.9	58.1	8.5	10.1	4.9	0.8	62.9	6.2	10.1	6.4	3.0	57.4	4.4	13.0
	4	1.0	-	9.1	28.1	0.3	3.8	2.9	62.5	7.9	7.9	8.0	4.6	51.6	8.1	7.6	8.2	4.8	64.9	6.4	9.9
	5	1.1	-	9.9	24.5	0.4	4.6	3.7	59.5	4.8	12.4	5.4	0.0	59.8	4.8	12.5	6.7	3.3	58.0	4.3	13.8
	6	1.1	-	6.0	29.8	0.3	3.3	2.4	59.3	7.6	7.7	5.9	2.5	57.9	10.5	5.5	-	-	-	-	-
Average		0.9	-	7.2	27.9	-	3.6	2.7	59.8	6.2	-	5.4	2.0	60.0	7.1	-	7.7	4.3	64.1	4.9	-
Type of brine solution		Period 3 (6 weeks)						Period 4 (8 weeks)						Period 5 (10 weeks)				Period 6 (12 weeks)			
		Moisture		Oil		Ratio	Moisture	Moisture		Oil		Ratio	Moisture	Moisture		Oil		Ratio	Moisture		
		TBA/	value	TBA/	value			TBA/	value	TBA/	value			TBA/	value	TBA/	value			TBA/	value
		..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	..(Percent)..	
10 percent brine	1	10.7	7.6	63.5	4.7	13.5	22.4	19.3	60.3	12.8	4.7	9.0	5.9	59.3	5.4	11.0	24.9	21.8	58.1	11.0	5.3
	2	9.7	6.6	60.7	4.0	15.2	21.2	18.1	57.6	15.0	3.8	11.2	8.1	59.7	6.9	8.7	13.9	10.8	57.9	6.7	8.6
	3	7.5	4.4	61.0	3.9	15.5	9.5	5.4	61.2	4.3	16.2	14.3	11.2	61.0	6.7	9.1	12.9	9.8	58.3	8.1	7.2
	4	19.1	16.0	56.8	12.2	4.8	16.0	12.9	59.6	8.5	7.0	7.9	4.8	60.9	4.5	13.5	19.8	16.0	60.9	15.0	6.1
	5	15.2	12.1	58.3	9.6	6.1	10.9	7.8	59.6	8.2	7.3	7.1	4.0	60.2	5.0	12.0	12.5	9.4	62.1	6.3	9.9
	6	9.4	6.3	62.5	4.6	10.1	11.5	8.4	60.6	7.2	8.4	11.6	8.5	61.2	6.0	10.2	10.6	7.5	61.1	6.9	8.9
Average		11.9	8.8	60.8	6.8	-	15.1	12.0	59.8	9.3	-	10.2	7.1	60.4	5.8	-	15.6	12.5	59.6	7.7	-
0.1 percent HRT/and 1.0 percent potassium sorbate in 10 percent brine	1	9.0	5.0	65.7	4.0	16.4	6.3	2.3	63.9	4.7	13.6	7.3	5.3	62.3	6.7	9.3	4.8	0.8	65.1	2.0	32.6
	2	9.5	5.5	59.2	5.5	10.8	8.9	4.9	60.2	5.6	10.8	10.3	6.5	60.3	11.1	5.4	7.9	3.9	60.8	7.2	8.4
	3	10.4	6.4	62.6	5.7	11.0	7.9	3.9	64.6	3.6	17.9	8.6	4.6	60.8	5.9	10.5	8.4	4.4	62.2	6.2	10.0
	4	10.7	6.7	60.1	6.5	2.9	12.4	2.6	62.1	3.1	15.3	10.0	3.0	60.5	7.7	7.8	11.9	7.9	58.5	10.1	8.6
	5	7.4	3.4	61.2	4.0	10.0	10.8	6.8	48.7	12.7	3.8	4.1	0.1	61.3	3.7	16.7	5.8	1.8	61.1	13.2	8.8
	6	9.5	4.9	59.2	5.6	10.6	9.3	5.3	62.0	6.7	9.3	8.3	4.3	62.4	7.5	8.5	8.0	4.0	50.7	5.3	9.6
Average		9.3	5.3	61.3	5.8	-	8.3	4.3	62.5	6.4	-	7.6	3.6	61.3	7.3	-	7.8	3.8	59.9	5.7	-
1.0 percent potassium sorbate in 10 percent brine	1	9.3	6.1	63.2	6.1	10.4	11.6	8.4	62.2	4.0	15.6	6.1	2.9	62.5	5.6	11.2	5.1	1.9	58.6	2.9	20.1
	2	7.7	4.5	64.0	4.7	13.6	11.7	6.5	59.6	5.1	11.7	9.6	6.4	60.0	6.8	8.8	5.3	2.3	61.4	2.2	19.3
	3	6.7	3.5	58.6	4.7	12.5	11.7	6.5	63.5	4.1	15.4	7.5	4.5	61.0	6.8	9.0	5.0	1.8	62.9	3.7	17.0
	4	5.9	2.7	63.8	2.6	24.5	12.4	2.6	62.1	3.1	15.3	10.9	7.7	60.8	6.8	9.2	7.2	4.0	60.4	6.8	8.9
	5	6.0	2.8	62.2	2.6	23.9	12.0	0.8	61.2	6.2	9.9	8.2	5.0	61.0	5.5	11.1	8.8	5.6	59.8	7.1	8.4
	6	12.2	9.0	59.9	13.8	4.3	11.5	8.3	58.0	8.6	6.7	8.6	5.4	60.3	3.4	11.2	10.0	6.8	58.0	5.2	11.2
Average		6.0	4.6	62.0	5.8	-	11.8	8.6	61.2	5.4	-	8.5	5.3	60.9	6.1	-	6.9	3.7	60.1	4.8	-
0.1 percent HRT/and 1.0 percent potassium sorbate in 10 percent brine	1	6.5	3.1	57.7	3.5	16.5	14.1	10.7	60.3	7.7	7.8	6.0	2.6	62.8	6.8	9.2	7.4	4.0	60.0	7.7	7.8
	2	6.7	3.3	59.6	3.1	19.2	11.3	7.9	64.2	3.0	21.4	7.4	4.0	60.1	7.3	8.2	8.3	4.9	59.7	7.6	7.9
	3	6.9	3.5	56.3	7.2	7.8	12.5	9.1	58.1	6.4	6.9	5.8	2.4	55.2	9.4	5.9	10.5	7.1	58.7	8.2	7.2
	4	11.7	7.8	57.3	8.5	6.7	12.4	12.0	57.3	10.9	5.3	5.2	1.6	62.5	3.8	15.4	10.7	7.3	73.0	8.2	8.9
	5	6.5	3.1	58.4	6.2	7.1	10.5	7.1	59.0	9.9	6.0	9.4	6.0	62.6	5.0	12.5	4.4	1.0	66.6	7.1	8.4
	6	7.3	3.9	59.9	5.3	11.3	9.1	5.7	58.3	9.2	6.3	6.7	3.3	60.5	4.0	15.1	5.0	1.6	60.3	3.3	18.3
Average		7.5	4.1	58.2	6.0	-	12.2	8.8	59.5	8.2	-	6.8	3.4	60.6	6.1	-	7.7	4.3	63	6.4	-

1/Corrected to average moisture content (60.8%).

2/Corrected for blank contributed by contents of brining solutions.

3/Corrected for blank contributed by contents of brining solutions and smoking process.

4/Attributed hydroxy toluene.

from 1.5 percent to 15.0 percent and averaged 6.4 percent. The TBA values were not corrected to the average oil content.

Thiobarbituric acid is known to form the characteristic red pigment with a number of oxidation products of unsaturated fatty acids (Tarladgis, Watts, and Younathan 1960) and aldehydes from other sources, as well as a characteristic yellow pigment with certain other aldehydes (Patton 1960). Since the smoke deposit on the surface of fish fillets is known to contain a variety of aldehydes (Shewan 1949), it was necessary to ascertain the amount of TBA color that could be attributed to the smoke constituents. For the same reason, fillets that had not been smoked but had been brined were analyzed to determine the effect of the brining solutions on the development of the TBA color. The fillets that were not smoked comprised the negative control and those that were smoked comprised the positive control.

The group of fish comprising the negative control had been treated identically with the smoked fish up to the point where the fish were dried during the smoking process. The negative control group was dried in a laboratory oven for a length of time and at a temperature similar to that used in smoking the fish fillets. The average TBA value of the fish brined in 10-percent salt solution was 0.6; in 0.1 percent butylated hydroxy toluene, 1.5; in 1.0-percent potassium sorbate, 0.7; and in the combination of 1.0-percent butylated hydroxy toluene and 1-percent potassium sorbate, 0.9.

The positive control consisted of six fish from each group, which were analyzed the day immediately following smoking. The average TBA values of the six fish from each group were as follows: control, 2.9; 0.1-percent butylated hydroxy toluene, 2.9; 1.0-percent potassium sorbate, 4.3; and 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate, 3.6. It thus is apparent that when the negative control of each group is subtracted from the positive control of the same group, a certain amount of apparent TBA value is due to substances deposited during the smoking process. The error of the mean of the four groups at the critical 6-week interval ranged from 0.4 (0.1-percent butylated hydroxy toluene) to 1.6 (control) and averaged 0.9. The average TBA value found to be due to the smoking process was 2.5, and since this value exceeded the average error of the mean, it was subtracted from all succeeding TBA values. In addition, the apparent TBA value due to the brining process found in each negative control group was subtracted from subsequent TBA values. The TBA values reported in table 1, therefore, can be considered for the purpose of this paper to be due to an increase in rancidity alone.

In the correlation of the organoleptic scores with the TBA values found, it becomes apparent that the fillets with a TBA value less than 7.8 could be considered as not rancid, and the fillets with TBA value greater than 7.8 could be considered rancid (95-percent confidence level). Fillets with a TBA value of less than 5.0 could be considered good (95-percent confidence level). Those with TBA values ranging from 5.0 to 7.8 could be classified as fair. For the purposes of this experiment, then, fillets with a TBA value ranging from 0.0 to 5.0 were considered good, those ranging from 5.0 to 7.8 were considered fair, and those with values 7.8 and above were considered rancid. The organoleptic tests correlated to a high degree (99-percent confidence level) with the TBA values, indicating that the TBA test for rancidity is reliable in the case of smoked mullet fillets.

After 2 weeks' storage of the smoked fillets, the average TBA value (4.5) of the six fillets in the control group showed them as being in the good class. Within 4 weeks, the average TBA value (7.3) showed these fillets to be fair, whereas after 6 weeks, the fillets had become rancid (8.8).

In the group of fillets brined with the addition of 0.1-percent butylated hydroxy toluene, it was found after 2 weeks of storage that the average TBA value of the fillets was well within the good class (1.6). After storage for 4 weeks, the average TBA value (3.9) showed that the fillets had remained in the good class, and after storage for 6 weeks, the average TBA value (5.3) showed that they had passed into the fair class. The average TBA values showed these fillets as remaining in the upper range of the good class throughout the remainder of the experiment.

In the case of the fillets brined in 1.0-percent potassium sorbate, the average TBA value (2.5) after 2 weeks of storage showed the fillets to be in the good class; after 4 weeks of stor-

age, the average TBA value (3.8) showed the fillets to remain in the good class; and after 6 weeks' storage, the average TBA value (4.8) showed the fillets remaining in the upper range of the good class. Within 8 weeks the average TBA value (8.6) showed the fillets as having passed into the rancid class.

After 2 weeks' storage of the fillets brined in 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate, the average TBA value (2.0) showed the fillets as being in the good class; after 4 weeks' storage, the average TBA value (4.3) showed that the fillets had remained in the good class; and, after 6 weeks' storage, the average TBA value (4.1) showed that the fillets had still remained in the good class. Within 8 weeks, the average TBA value (8.8) showed that the fillets had passed into the rancid class.

DISCUSSION

A rather marked disappearance of the smoky flavor was noticed by the taste panel after approximately 6 weeks' storage. This disappearance of smoky flavor, due to the slow volatilization or degradation of the smoke flavor components, has been recognized by the commercial industry. The time limit for protection against the development of rancidity has been suggested to be approximately 6 weeks. It can be noted from figure 2 that at approximately 6 weeks, the average TBA value had progressed from the upper range of the good class to the fair group. The treated groups followed a different pattern from that of the nontreated group through approximately the first 6 weeks of storage. From the 6th to the 8th week, the rate of rancidification of the fillets treated with 1.0-percent potassium sorbate and with the combination 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate approached that of the control group, whereas the development of rancidity in the 0.1-percent butylated hydroxy toluene group was retarded.

From a marketing standpoint, 6 weeks appears to be the limit of the shelf life of smoked mullet fillets. The limiting factor here is not the development of mold or rancidity, but the loss of smoky flavor. There is a significant difference between the means of the TBA values of the treated groups and the mean of the control group until the 6th week of storage. No significant difference is noted between the means of the TBA values of the three treated groups, but at the 6th week there is no significant difference between the means of all four groups. It thus seems that in the use of potassium sorbate to retard the development of mold, an additional benefit is secured in sufficiently lengthening the induction period before the development of rancidity to permit the storage of the fillets for the desired market life of 6 weeks.

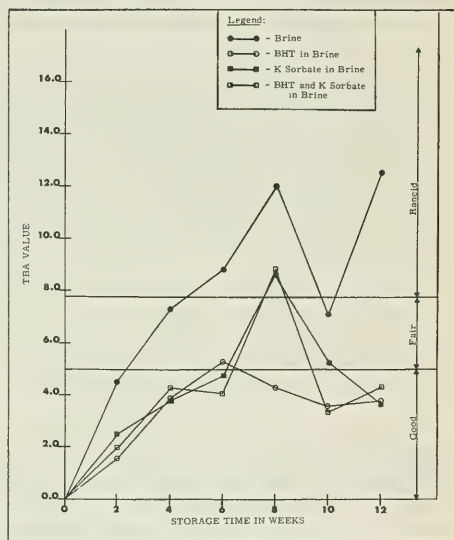


Fig. 2 - Change in TBA values with storage time. The relative position of the average TBA values within the organoleptic classes is shown for the four groups--(1) control, 10-percent brine, (2) 0.1-percent butylated hydroxy toluene in 10-percent brine, (3) 1.0-percent potassium sorbate in 10-percent brine, and (4) 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate in 10-percent brine.

Although the marketable life of the mullet fillets had been determined as 6 weeks, the experiment was carried on for a period of 6 additional weeks to study the effects of the butylated hydroxy toluene, potassium sorbate, and the combination of both on the development of rancidity. It became apparent that butylated hydroxy toluene was the most effective antioxidant, since the rancidity, as indicated by the average TBA values, increased slowly, leveled, and remained the same. From the 6th to the 10th week, the group treated with 1.0-percent potassium sor-

bate and the group treated with 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate exhibited the same pattern of increase and decrease of TBA value as did the control samples. From the 10th to the 12th week, the average TBA value of the control sample increased, whereas the average TBA values of the treated groups decreased or remained the same. These trends could perhaps be due to the production of a compound capable of producing a color with thiobarbituric acid and its subsequent destruction during the rancidification process. The next step in the degradation process could then be seen as being the formation in the control group of another such compound, which is absent from the other groups.

There is little evidence in the literature to suggest that potassium sorbate had previously been considered as being an antioxidant or as having antioxidant properties. It has been suggested that the mechanism of the antimycotic action of potassium sorbate is due to the fact that once deposited on the meat of the fish, it hydrolyzes into sorbic acid. Sorbic acid is an unsaturated fatty acid similar to those formed in the enzymatic dehydrogenation reaction necessary to sustain mold growth, and when present in excess it tends to inhibit this reaction and consequently the growth of the mold (Pfizer 1955). It is possible that (1) by preventing the dehydrogenation of fatty acids in the mullet oil, it prevents the formation of free radicals necessary to the development of rancidity or (2) because of its fatty acid structure, it preferentially selects the available oxygen. The latter course seems the more likely, since the potassium sorbate seems to function in the case of smoked mullet merely to lengthen the induction period before the development of rancidity but is not as effective in this regard as is butylated hydroxy toluene.

There is a definite correlation between the TBA value, the oil content of the fillets, and the length of storage for all four groups. The F values obtained in the correlation of these three factors show significant correlation at 99-percent level in the control group, at the 99-percent level in 0.1-percent butylated hydroxy toluene group, at the 95-percent level in the 1.0-percent potassium sorbate group, and at the 99-percent level in the combination 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate group. The deposits of oil in the mullet fillets appeared in areas, irregular in size and shape, between the skin and the meat of the fillets. The surface area of oil exposed to the limited supply of oxygen in the vacuum-pack bags varied considerably from fillet to fillet. Since the rate of oxidation of oil is thought to be correlated with the area of surface exposed to the air (Polmater, Yu, Sinnhuber 1960), it appears that the oil content of the fillet and the development of rancidity are not necessarily completely interdependent, which would account for the variation in F values. The correlation of the TBA value, oil content, and length of storage above the 95-percent confidence level in all cases, and the correlation of the TBA value and organoleptic tests (at the 99-percent confidence level), indicate that the value of the TBA is dependent on the degree of rancidity developed during a specific storage period.

There is a correlation between the TBA values, the moisture content, and the length of storage in the control group (99-percent confidence level). The groups treated with 0.1-percent butylated hydroxy toluene, 1.0-percent potassium sorbate, and the combination of 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate show no significant correlation between the TBA value, the moisture content, and the length of storage. The TBA values, ratio of moisture to oil content, and time of storage, however, correlate at the 99-percent confidence level for the control group and the 0.1-percent butylated hydroxy toluene group, at the 97-percent confidence level for the 1.0 percent potassium sorbate group and, at the 90-percent confidence level, for the combination 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate group. The increase in correlation that was found by the use of the ratio of moisture to oil content rather than the moisture content alone seems to suggest that there is a relationship between the oil and moisture contents of the fillets and the development of rancidity as evidenced by the TBA value.

SUMMARY

Mullet fillets were smoked and divided into groups according to the following four types of brine solution used:

(1) 10-percent brine solution.

(2) 0.1-percent butylated hydroxy toluene in 10-percent brine solution.

(3) 1.0-percent potassium sorbate in 10-percent brine solution.

(4) 0.1-percent butylated hydroxy toluene plus 1.0 percent potassium sorbate in 10-percent brine solution.

The fillets were then stored at 37° F. for 12 weeks, with samples being analyzed for the development of rancidity by the thiobarbituric acid method at intervals of 2 weeks.

Organoleptic tests indicated that smoky flavor gradually disappeared and that after a period of 6 weeks the fillets were considered not suitable for marketing for this reason. For 6 weeks, the butylated hydroxy toluene, potassium sorbate, and combination of both prevented the development of discernible rancidity. After 6 weeks, potassium sorbate and the combination of potassium sorbate and butylated hydroxy toluene allowed an increase in the rate of the development of rancidity, whereas the butylated hydroxy toluene did not. Apparently, it is possible to utilize potassium sorbate both as an antimicrobial and as an agent to lengthen the induction period preceding the development of a noticeable rancidity during the marketable life of the smoked mullet fillets.

The TBA value, the oil content, and the length of storage correlate in all four groups at or above the 95-percent confidence level. The TBA values and organoleptic values correlate at the 99-percent confidence level. This correlation indicates that the TBA test is adequate for prediction of rancidity in smoked mullet fillets. The TBA value, the moisture content, and the length of storage correlate in the control group at 99-percent level and do not correlate for the groups treated with 0.1-percent butylated hydroxy toluene, 1.0-percent potassium sorbate, and the combination of 0.1-percent butylated hydroxy toluene and 1.0-percent potassium sorbate. On the other hand, the TBA values, the ratio of the moisture to the oil content, and the time of storage correlate at the 90-percent confidence level or above for all groups. This finding indicates that the moisture content of the fillets is involved in some manner in the development of rancidity.

LITERATURE CITED

- CHARLES PFIZER AND CO., INC.
1955. Sorbistat (Sorbic Acid, Pfizer). Data sheet no. 510, Charles Pfizer and Co., Inc., Brooklyn, N. Y., p. 4.
- ERDMAN, ANNA MARIE; WATTS, BETTY M.; and ELLIAS, LORETTA C.
1954. Smoke Flavor and Ascorbic Acid as Preservatives for Fatty Fish. *Food Technology*, vol. 8, no. 7 (July), pp. 320-323.
- GEMINDER, J. J.
1959. Use of Potassium and Sodium Sorbate in Extending Shelf-Life of Smoked Fish. *Food Technology*, vol. 13, no. 8 (August), pp. 459-461.
- PALMATER, ROBERT E.; YU, T. C.; and SINNHUBER, RUSSEL O.
1960. An Accelerated Oxidation Method for the Estimation of the Storage Life of Frozen Seafoods. *Food Technology*, vol. 14, no. 10 (October), pp. 528-532.
- PATTON, STUART
1960. Response of Epihydrin Aldehyde and Glyceraldehyde in the Thiobarbituric Acid Test for Fat Oxidation. *Food Research*, vol. 25, no. 4 (July-August), pp. 554-556.
- SAENZ, WILLIAM and DURBROW, DAVID L.
1959. Control of Rancidity in Vacuum-Packed Frozen Mullet Fillets. The Marine Laboratory, University of Miami, *Annual Report 1958-1959*, October, Miami, Fla., 11 pp.
- SHEWAN, J. M.
1949. The Biological Stability of Smoked and Salted Fish. *Chemistry and Industry*, vol. 27, no. 28 (July), pp. 501-506.
- SINNHUBER, RUSSEL O. and YU, T. C.
1958. 2-Thiobarbituric Acid Method for the Measurement of Rancidity in Fishery Products. II. - The Quantitative Determination of Melon-aldehyde. *Food Technology*, vol. 12, no. 1 (January), pp. 9-12.
- TARLADGIS, BASIL G.; WATTS, BETTY M. and YOUNATHAN, MARGARET T.
1960. A Distillation Method for the Quantitative Determination of Malonaldehyde in Rancid Foods. *Journal of the American Oil Chemists' Society*, vol. 37, no. 1 (January), pp. 44-48.
- WATERS, MELVIN E.
1961. Inhibition of Mold on Smoked Mullet. *Commercial Fisheries Review*, vol. 23, no. 4, pp. 8-13. (Also Separate No. 617.)
- YU, T. C. and SINNHUBER, RUSSEL O.
1957. 2-Thiobarbituric Acid Method for the Measurement of Rancidity in Fishery Products. *Food Technology*, vol. 11, no. 2 (February), pp. 104-108.



TRENDS AND DEVELOPMENTS

Alaska

NONRESIDENT COMMERCIAL FISHERMEN RESTRICTIONS RULED UNCONSTITUTIONAL:

The Emergency Commercial Fishing Measures Act of the 1961 Alaska Legislature allowed the Board of Fish and Game to close fishing districts to nonresident commercial fishermen if it was determined that there would be a poor salmon run in the district involved. A three-man Federal Court in Juneau on February 14 ruled that the Alaska Act is unconstitutional.

The Act was challenged by 17 individuals and 8 packing companies. These sought an injunction prohibiting the Fish and Game Board from enforcing the provisions of the law. In an opinion cited by Circuit Court Judge Homer T. Bone and District Judges Walter H. Hodge and Charles L. Powell, the injunction was granted. The opinion, in part, stated that "Any discrimination must be reasonable to be sustained. Here nothing appears that will in any way justify the application of the prohibition to nonresidents and not to residents."



California

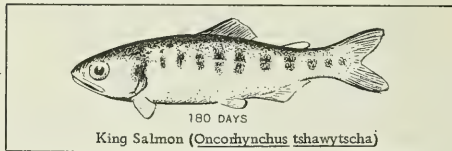
MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62N1a and 62N1b Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel Nautilus were continued (January 8-11, 15-19, 1962) in the Carquinez Strait area to capture marked salmon fingerlings on their seaward migration. A nylon midwater trawl with 25-foot square opening was used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3 p.m. and each

tow was for 20 minutes. Surface tows were alternated between upstream and downstream and between the north shore, center, and south shore of the channel. Deep tows were confined to the center of the channel.

A total of 95 tows was completed in the Strait during this cruise yielding a catch of 39 king salmon (*Oncorhynchus tshawytscha*) fingerlings, and one king salmon adult; none of which was marked.



Other species appearing in the catch consisted mostly of striped bass (*Morone saxatilis*)--1,846 fish, northern anchovy (*Engraulis mordax*)--1,105 fish, Sacramento smelt (*Spirinchus thaleichthys*)--899 fish, American shad (*Alosa sapidissima*)--967 fish, Pacific herring (*Clupea pallasii*)--69 fish, tomcod (*Microgadus proximus*)--56 fish, and King salmon (*Oncorhynchus tshawytscha*)--40 fish.

Note: See *Commercial Fisheries Review*, Feb. 1962 p. 13.

Cans--Shipments for Fishery Products,

January-December, 1961

Total shipments of metal cans during January-December 1961 amounted to 126,018 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 123,929 tons in the same period of 1960. Canning of fishery products in 1961 was



confined largely to tuna, jack mackerel, Pacific salmon, and Maine sardines. Although the packs of Maine and California sardines, and shrimp were down, greater packs of tuna and salmon more than offset those declines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in January 1962 by the Defense Subsistence Supply Centers than in December 1961. The drop in the quantity purchased was 6.7 percent and the value was down 10.2 percent. As compared with the same month in 1961, purchases in January 1962 were down 5.7 percent in quantity, but up 7.7 percent in value. Higher prices and the purchase of higher-priced products accounted for the increase in value this January.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January 1962 with Comparisons

QUANTITY		VALUE	
January	January	January	January
1962	1961	1962	1961
.. (1,000 Lbs.) ..	..	.. (\$1,000) ..	..
1,751	1,856	996	925

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1962 averaged 56.9 cents a pound, about 7.1 cents a pound more than the 49.8 cents a pound paid in January 1961. The higher average price for purchases this January are attributed to generally higher prices for most fishery products because of light supplies.

Canned: Canned tuna was the principal canned fishery product purchased for the use

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January 1962 with Comparisons

Product	QUANTITY		VALUE	
	January	January	January	January
	1962	1961	1962	1961
	.. (1,000 Lbs.) ..	..	.. (\$1,000) ..	..
Tuna	3,113	1,002	1,739	442
Salmon	-	-	-	-
Sardine	3	21	2	11

of the Armed Forces in January 1962. The amount was the largest ever purchased of canned tuna during a single month.

Note: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than reported above.

(2) The Military Subsistence Supply Agency, effective January 1, 1962, changed its name to Defense Supply Agency. Also, the field offices were redesignated Defense Subsistence Supply Centers.

(3) See *Commercial Fisheries Review*, March 1962 p. 14, February 1962 p. 18.



Frozen Foods

NEW INDICATOR RECORDS TIME-TEMPERATURE EXPERIENCE:

A frozen food temperature monitor has been made available by a Los Angeles manufacturer of temperature indicators. It will register environmental temperatures for frozen foods from processor to consumer.

A flexible tab with pressure-sensitized adhesive applicable to most surfaces, the indicator (enveloped in a plastic jacket) has four easily-read windows. The tabs are easily read.

The monitor works on a time-temperature basis, and activates on immersion in tap water for about a minute, at the end of which the activation indicator turns pink. Excess water is removed by shaking, and the tab, for accurate recording, should be placed in cold storage within five minutes.

The tab will stay in place, after its protective backing is removed, until removed.

Time-temperature experience is recorded as on a thermometer. The four windows, initially blue-gray, will turn bright red from the left end at a rate dependent on the temperature, and the red indication, which is irreversible, moves across the tab commensurate with the length of temperature exposure.

Simulating the behavior of frozen food, the red zone will travel the full length of the graduated scale in about one year or more at 0° F., 3 months at 10° F., 2 to 3 weeks at 20° F., and about one day at 30° F. Infinite variations in time-temperature rates are available. (*Frosted Food Field*, January 1962.)



Gulf Fishery Investigations

LARGE-SCALE BROWN SHRIMP MARKING EXPERIMENT IN GULF OF MEXICO:

A large-scale brown shrimp marking experiment was started in the northwest Gulf of Mexico in March 1962 by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries. This is part of the Bureau's expanded program of research on the Gulf of Mexico shrimp stocks. Objectives of the experiment will be to secure a reliable index of the rate of fishing, together with information on the movement and growth of shrimp.

processing plants. A second experiment involving similar numbers of shrimp will be started in July 1962. Therefore, stained or tagged shrimp will be appearing in catches during most of 1962.

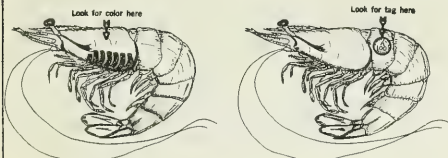
Of particular value will be the number of marked shrimp subsequently recaptured, detected, and returned. The nature of the experiment requires that the highest possible number of marked specimens be detected and returned for analysis. Posters describing the project and giving information on how marked shrimp recoveries should be disposed of are prominently displayed at shrimp landing ports.

ROLE THAT NORTHERN GULF OF MEXICO CURRENTS PLAY IN MOVEMENT OF YOUNG SHRIMP BEING STUDIED:

As another part of an expanded shrimp research program, the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in February 1962 started a study of water currents in the northern

STAINED SHRIMP \$ 2.00 REWARD

SHRIMP HAVE BEEN MARKED WITH BLUE AND GREEN BIOLOGICAL STAINS OR SMALL GREEN PLASTIC DISKS TO OBTAIN INFORMATION ON MOVEMENTS, GROWTH, AND RATE OF HARVEST. THE DYE ONLY APPEARS ON THE SIDES OF THE HEAD (IN THE GILLS) WHILE THE SMALL PLASTIC DISKS ARE FASTENED IN THE TAIL AS SHOWN IN THE ILLUSTRATION.



A REWARD OF \$2.00 WILL BE PAID FOR STAINED OR TAGGED SHRIMP WHEN RETURNED WITH THE FOLLOWING INFORMATION:

1. Exact place the shrimp was caught.
2. Date the shrimp was caught.

NOTIFY THE GALVESTON BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FORT CROCKETT, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE AGENT AT ANY PORT OF LANDING.

Poster on the shrimp marking project being displayed at Gulf States fishing ports.

The capture, marking, and release of the experimental shrimp was done aboard the exploratory fishing vessel Silver Bay. About 2,000 shrimp marked with green stain and an additional 2,000 shrimp tagged with small green plastic disks attached to the tail were released. The stain injected into shrimp ultimately concentrates in restricted areas of the head. Commercial shrimp catches should be carefully examined for marked or stained shrimp on the vessels as well as in the

REWARD

DRIFT BOTTLES AND SEABED DRIFTERS HAVE BEEN RELEASED AT KNOWN LOCATIONS IN THE GULF OF MEXICO BY SCIENTISTS FROM THE GALVESTON BIOLOGICAL LABORATORY. THESE RELEASES ARE PART OF A STUDY TO DETERMINE THE ROLE THAT WATER CURRENTS PLAY IN THE MOVEMENT OF YOUNG SHRIMP FROM OFFSHORE SPAWNING GROUNDS TO INSHORE NURSERY GROUNDS.



A REWARD OF 50¢ WILL BE PAID FOR DRIFT BOTTLE ENCLOSURES AND SEABED DRIFTER LABELS WITH FOLLOWING INFORMATION:

1. Exact place the bottle or seabed drifter was found.
2. Date of find.

NOTIFY THE GALVESTON BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FORT CROCKETT, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE AGENT AT ANY PORT OF LANDING.

Replica of poster on drift bottles and seabed drifters being displayed in Gulf States shrimp landing ports.

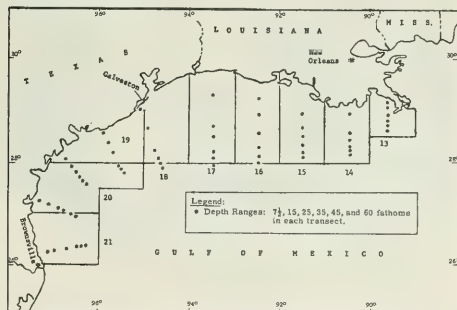
Gulf of Mexico. The objective will be to determine the role that water currents play in the movement of young shrimp from off-shore spawning grounds to inshore nursery grounds.

Each month 12 drift bottles and 6 seabed drifters will be released at each of 60 trawling stations located between the Mississippi Delta and Brownsville, Tex. The first seabed drifters and drift bottles were released in the northwestern Gulf of Mexico February 17-March 1, 1962. The drift bottles could be carried by surface currents to any point on the shore of the Gulf of Mexico. The seabed drifters are designed to measure currents on the bottom and will most often be recovered in shrimp trawls.

The success of the study will depend upon accurate reporting of the location and time the drift bottle or seabed drifter is found. Both of these devices are virtually indestructible and may be returned over a long period of time. Posters describing the project and giving information on how recovered drift bottle cards and seabed drifter labels are to be returned are displayed at shrimp landing ports.

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-17 and "Miss Angela" Cruise MA-11: Bad weather interfered with the shrimp sampling conducted by the M/V Belle of Texas and Miss Angela between February 17-28, 1962. Both of these research vessels are operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico.



Shows the station pattern for cruise BT-17 of the M/V Belle of Texas and cruise MA-11 of the M/V Miss Angela, February 17-28, 1962.

During these cruises good catches of 15-20 count heads-on shrimp were made in the 40-60 fathom range off Terrebonne Bay and in the 20-40 fathom range off Morgan City, La. But the amount caught was not as great as the amount caught in previous cruises in area 19 the latter part of January.

A total of 9 statistical areas were covered. In each area one 3-hour tow was made in each of six depth ranges. A 45-foot shrimp trawl was used. Most of the catches were brown shrimp, although there were some small catches of white shrimp. The largest catch was 47 pounds of brown shrimp, 12-15 count heads on, in area 14 in 40-60 fathoms. The next largest catch was in 20-40 fathoms in area 15, and it consisted of 35 pounds of brown shrimp 15-20 count heads on.



Industrial Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, January 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for January 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the following table.

U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, January 1962 (Preliminary) with Comparisons				
	Meal Short Tons	Oil 1,000 Gallons	Solubles Short Tons	Homogenized Short Tons
January 1962:				
East & Gulf Coasts . .	661	35	117	20
West Coast ^{2/}	2,010	39	1,452	-
Total	2,671	74	1,569	20
January 1961 Total . .	2,723	55	1,064	65

^{1/} Does not include crab meal, shrimp meal, and liver oils.
^{2/} Includes Hawaii, American Samoa, and Puerto Rico.

Major Indicators, February 1962:

Fish Meal Production and Imports				
Item and Period	1962	1961	1960	1959
..... (Short Tons)				
Production ^{2/} :				
February	1/	2,071	1,923	2,128
January	2,670	2,713	2,433	3,095
December	-	12,750	9,185	14,381
Jan.-Dec. 3/	-	289,039	257,969	275,396
Jan.-Dec, final totals	-	1/	280,137	306,551

(Table continued on following page.)

Fish Meal Production and Imports (Contd.)					
Item and Period	1962	1961	1960	1959	1958
Imports:					
February	1/	14,344	8,081	19,463	11,219
January	1/	9,531	8,571	19,700	7,696
December	-	23,268	15,564	5,538	8,490
Jan.-Dec, totals	-	217,845	131,561	132,955	100,352

Fish Solubles Production and Imports					
Item and Period	1962	1961	1960	1959	1958
Production 4/:					
February	1/	1,502	1,812	2,211	1,133
January	1,590	1,129	1,392	1,828	825
December	-	4,606	2,897	5,430	6,305
Jan.-Dec, totals	-	109,780	98,929	165,359	130,177
Imports:					
February	1/	155	1,875	398	149
January	1/	219	214	954	473
December	-	472	60	420	5,180
Jan.-Dec, totals	-	6,739	3,174	26,630	14,567

Fish Oil Production and Exports					
Item and Period	1962	1961	1960	1959	1958
Production:					
February	1/	44	51	38	49
January	75	55	46	64	46
December	-	1,488	1,038	1,865	1,839
Jan.-Dec, 3/ 5/	-	33,471	26,690	24,418	21,957
Jan.-Dec, totals	-	1/	27,886	24,978	22,028
Exports:					
February	1/	2,327	3,177	999	1,038
January	1/	1,793	276	898	825
December	-	1,398	2,108	2,611	383
Jan.-Dec, totals	-	16,331	19,155	19,264	12,539

1/Not available.
 2/Does not include crab, shrimp, and miscellaneous meals.
 3/Preliminary data computed from monthly data.
 4/Includes homogenized fish.
 5/Represents over 95 percent of the total production.
 Note: Data for 1961 are preliminary.

* * * * *

Production and Foreign Trade, 1961: During 1961, meal and scrap production amounted to 289,000 tons--9,200 tons above 1960. The marine animal oil yield totaled 33.5 million gallons--a gain of 5.6 million gallons compared with 1960.

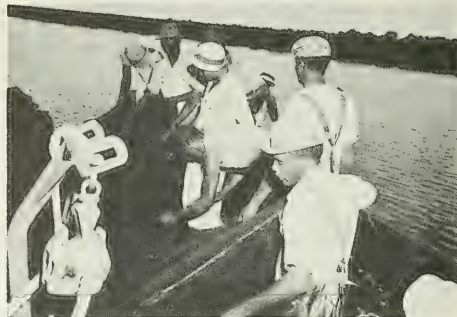
Imports of fish meal in 1961 (218,000 tons) were 66 percent greater than in 1960, and imports of fish solubles (6,739 tons) were up 112 percent. Exports of fish oils and fish-liver oils in 1961 amounted to 122 million pounds (16.3 million gallons)--21.2 million pounds (282,300 gallons) below 1960.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, 1961 with Comparative Data		
Product	1961 1/	1960
Fish Meal and Scrap:		
Alewife	89	1,092
Herring:		
Alaska	3,810	6,103
Maine	1,239	2,915
Menhaden 2/	246,990	218,423
Sardine, Pacific	2,744	3,508
Tuna and mackerel	21,432	26,499
Unclassified	12,735	21,288
Total	289,039	279,828
Shellfish and marine animal meal and scrap	10,000	10,309
Grand total meal and scrap	299,039	290,137
Fish solubles	98,003	89,377
Homogenized condensed fish	11,777	9,552
Oil, body:		
Alewife	6,900	73,950
Herring:		
Alaska	727,517	1,385,218
Maine	-	132,973
Menhaden 2/	30,814,537	24,453,736
Sardine, Pacific	83,010	160,121
Tuna and mackerel	751,590	509,195
Other (including whale)	1,087,610	1,137,782
Total oil	33,471,164	27,852,975

1/Preliminary data.
 2/Includes a small quantity produced from thread herring.
 Note: Excludes liver oils.

Table 2 - U. S. Foreign Trade in Selected Industrial Products, 1961 with Comparative Data		
Product	1961 1/	1960
Imports:		
Fish meal and scrap	217,845	131,561
Fish solubles	6,739	3,174
Whale oil, sperm (crude and refined)	7,807,625	4,836,847
Exports:		
Fish and fish-liver oils	122,485,721	143,659,471
Whale and sperm oil	1,205,674	1,400,714

1/Preliminary data.



At Empire, La., after a day's fishing, the purse-seine net used to fish menhaden is inspected for torn webbing by pulling it from one purse boat to the other.

* * * * *

Supply, 1960-61: As compared with 1960, fish meal production in the United States in 1961 was up 3.2 percent and imports 65.6 percent, which means that the available supply in the United States was 22.6 percent greater. Fish solubles production was up 11 percent and imports were up 112.3 percent, which means that the available supply of fish solubles was up 14 percent.

Table 1 - U.S. Supply of Fish Meal and Solubles, 1961 and 1960

Item	1961 ^{1/}	1960
	.... (Short Tons)	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	246,990	218,423
Tuna and mackerel	21,432	26,499
Herring, Alaska	3,810	6,103
Other	26,807	39,112
Total production	299,039	290,137
Imports:		
Canada	38,218	30,982
Peru	151,439	68,156
Chile	12,074	21,183
Angola	1,543	888
So. Africa Republic	13,026	7,073
Other countries	1,545	3,279
Total imports	217,845	131,561
Available fish meal supply ..	516,884	421,698
Fish Solubles:		
Domestic production ^{2/} ..	109,780	98,929
Imports:		
Canada	1,001	869
Denmark	28	1,858
Other countries	5,710	447
Total imports	6,739	3,174
Available fish solubles supply	116,519	102,103

^{1/}Preliminary.

^{2/}50 percent solids. Includes production of homogenized condensed fish.

From 1960 to 1961 the production of fish oil in the United States rose 20.2 percent, with most of the increase in menhaden.

Table 2 - U.S. Production of Fish Oil, 1961 and 1960

Product	1961 ^{1/}	1960
	.... (1,000 Gallons)	
Menhaden	30,815	24,454
Herring, Alaska	728	1,385
Tuna and mackerel	72	509
Sardine, Pacific	83	160
Other	1,093	1,345
Total	33,471	27,853

^{1/}Preliminary.

Note: Does not include fish-liver oil.

United States imports of fish meal were principally from Peru which supplied 69.5 percent of the total, followed by Canada, South Africa Republic, and Chile.

United States exports of fish oil from 1960 to 1961 dropped off 14.7 percent principally because West Germany, the Netherlands, and Sweden bought considerably less. Partially this was offset by greater purchases by Canada, Norway, and other countries.

Table 3 - U.S. Supply of Fish Meal and Solubles, 1951-1961 (Dry-Weight Basis)

Year	U.S. Production ^{1/}		Imports		Total
	Tons	Percent	Tons	Percent	Tons
1961 ^{2/}	353,695	61.5	*221,215	38.5	*574,910
1960	339,601	71.8	133,148	28.2	472,749
1959	*369,231	72.5	147,382	27.5	536,623
1958	313,228	74.3	108,167	25.7	421,395
1957	325,221	79.0	86,297	21.0	411,518
1956	360,207	79.6	92,089	20.4	452,296
1955	319,962	76.2	99,692	23.8	419,654
1954	314,482	68.1	147,584	31.9	462,066
1953	320,345	70.9	3/131,473	29.1	451,818
1952	291,885	58.9	3/203,539	41.1	495,424
1951	260,120	66.9	3/128,478	33.1	388,598

^{1/}Includes homogenized condensed fish.

^{2/}Preliminary.

^{3/}Imports of meal only. Data not available on imports of solubles.

* Record.

Note: Wet weight of solubles and homogenized condensed fish have been converted to dry weight by reducing their poundage by one-half.

Table 4 - U.S. Exports of Unclassified Fish Oil, 1961 and 1960

Destination	Total	
	1961	1960
	.... (1,000 Lbs.)	
Canada	16,935	9,846
Sweden	20,641	36,026
Norway	31,277	15,914
Netherlands	25,586	53,133
West Germany	15,590	26,083
Other countries	12,457	2,657
Total	122,486	143,659



Jellyfish

RESEARCH GRANT AWARDED TO UNIVERSITY OF MIAMI:

A grant of \$14,143 has been awarded to the Institute of Marine Science of the University of Miami by the U. S. Public Health Service. It is to be used for continuing research on the Physalia, more commonly known as the Portuguese Man-of-War, a type of jellyfish sometimes found in the surf and on the beaches of Florida.

The research on this animal has been going on for four years, during which much has been learned about the structure of the animal, how it survives, and its mode of living. For example, its float has been found to contain carbon monoxide, unique in animals of either the sea or land.

The poison contained in the tentacles, it has been ascertained, is a protein similar to cobra venom and nearly as poisonous. This

accounts for serious stings received by ocean bathers when they come in contact with the *Physalia*.

It is not yet known just how the *Physalia* makes either the poison or the carbon monoxide. These questions are now being studied along with attempts to find a remedy for the sting. (February 1962 news release from Institute of Marine Science.)



Maine Sardines

EXTENDED CANNING SEASON NOT PRODUCING:

A continued scarcity of fish has resulted in a virtual total failure as of mid-February 1962 of Maine's extended sardine canning season. With only 6,900 cases packed December 1 to February 9, even the most optimistic cannery, fishermen, and factory workers are wondering if they now won't have to wait for the usual spring runs of fish. (The normal season ended on December 1, 1961.) There were high hopes for sizable catches during the favorable February tides, but these did not materialize.

The bulk of the fish packed was produced by one Portland plant during the first two weeks of December and the only other action has been occasional small catches in eastern Washington County waters. Even these few fish have generally been too small to can profitably and most of them have gone to the fish meal and pearl essence plants.

Meanwhile the meager 679,000 cases produced during the regular 1961 season have been practically all sold and the shortage in the markets is getting acute. The average annual pack for the previous 20 years was 2.2 million cases.

The industry is now comparing the present situation with the summer of 1938 and winter of 1939 when the last critical fish shortage occurred. Conditions were very similar but corrected themselves during the spring and summer of 1939 when a total of 2,175,000 cases was packed.

Just before the regular April 15 to December 1 legal canning season closed last fall, the Maine Legislature, in Special Session, granted the cannery an extension to

permit sardine canning on a year-around basis until January 1, 1963.

This action was taken in anticipation of a sizable winter pack which would provide much needed employment in the coastal areas and permit the cannery to replenish their inventories and keep their customers supplied.

Although there is great disappointment in the industry over the failure of winter fishing for the first half of the period, all concerned figure that the odds are with 90 years of history in regards to the 1962 summer pack. "We cannot find any record of two really poor fish years in a row since the industry was founded in 1872," the Executive Secretary of the Maine Sardine Council stated.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SPRING 1962:

The United States domestic catch of fish and shellfish during 1961 amounted to 5.1 billion pounds—about 200 million pounds more than in 1960. These landings had a value to fishermen of \$364 million, about \$10 million more than in the previous year. Fish and shellfish for human consumption comprised about 2.5 billion pounds of total catch. The remainder was used for the manufacture of industrial products, bait, and animal food.



At a plant in Tampa, Fla., hand labor is used in peeling shrimp in order to produce a butterfly-fantailed breaded shrimp product.

During the spring months of 1962, per capita consumption of fishery products probably will increase slightly, and prices will remain moderately high. Retail prices for fishery products advanced during 1961, and are expected to remain at that high level until summer.

Supplies of fish and shellfish during the early spring months should be about the same as last year. Although

frozen inventories are presently at a low level, many fisheries will resume full operations with the beginning of spring weather.

Imports of edible fishery products into the United States during 1961 were greater than those of 1960. Continued high imports are expected early in 1962, especially for groundfish fillets and blocks, canned tuna, and shrimp. Exports of edible fishery products during 1961 were by far the lowest on record and prospects for increased shipments during the early months of 1962 are not bright.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 1962 issue of The National Food Situation (NFS-99).



Great Lakes Fisheries

Exploration and Gear Research

EXPLORATORY FISHING IN SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 1: The U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho was scheduled to begin its exploratory fishing operations on February 20, 1962, in the southern half of Lake Michigan from Ludington, Mich., on the eastern shore to Two Rivers, Wis., on the western shore.

The general plan of Cruise 1 of the Kaho was to conduct exploratory trawl fishing operations at various depths and areas in southern Lake Michigan at intervals of approximately 3 weeks.

The primary purpose of the cruise was to determine the location, bathymetric distribution, relative abundance, and seasonal availability of various species of fish to standard otter trawls. The information obtained was to help Lake Michigan fishermen determine the most productive trawling grounds.

The secondary purpose of the cruise was to collect data on the physical characteristics of the 154-fathom deep waters of Lake Michigan north of Ludington, Mich., in cooperation with the U. S. Department of Health, Education, and Welfare. This program was designed to determine the extent and effects of domestic and industrial wastes coming into Lake Michigan--both now and in the future.

Echo-sounding equipment was to be used to survey the bottom and detect subsurface fish concentrations. A 50-foot (headrope) Gulf of Mexico-type otter-trawl net was to be towed in representative areas to assess the commercial trawling potential. Bathymograph casts and water samples were to be taken at the 154-fathom depth.

Note: See Commercial Fisheries Review, January 1962 p. 17.



North Atlantic Fisheries Exploration and Gear Research

MIDWATER TRAWLING OPERATIONS START OFF NEW ENGLAND FOR 1962:

M/V "Delaware" Cruise 62-1 (Jan. 22-31, Feb. 6-15, 1962): Pelagic fishery explorations during the latter part of January and the first part of February 1962 were continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. Principal effort was devoted to scouting with sonic sounding and scanning equipment to locate schools of fish on or off the bottom.

The cruise was divided into two parts. During the first part most of the activity, which extended over a 10-day period, was spent along the edge of the continental shelf between the depths of 40 and 120 fathoms and in the areas bracketed by the Nantucket Light Vessel and Hudson Canyon.

Much of the time was spent close to known scup or porgy and butterfish fishing areas. Virtually no fish schools were seen in midwater (on echo-sounding equipment). The only indications of midwater life observed were sampled with a midwater trawl and proved to be Euphausiids (small shrimp-like crustaceans) and small deep-sea fish.

It is significant that commercial vessels working in the same area as the Delaware during this portion of the cruise had difficulty in obtaining good catches. The low availability of fish in midwater and typical winter weather conditions both contributed to poor catches with midwater trawl equipment.

During the second part of the cruise, operations were conducted in the Gulf of Maine

where effort was concentrated on a search for sardine-size herring. Areas scouted included the coast of Maine from Portland to West Quoddy Head and selected offshore areas. Coastal searches were made in depths between 20 and 60 fathoms. Offshore scouting was done over Grand Manan Bank and around Mt. Desert Rock. Other trawl tows were made in a deeper-water area (80-110 fms.) 20 miles SW. by S. of Matinicus Rock near Toothaker Ridge.

Fish traces were found in an area approximately $7\frac{1}{2}$ miles south of Cape Small in depths of 45 to 48 fathoms. On February 7 the fish traces were searched within 10 fathoms of the bottom during daylight hours and appeared to be concentrated into groups which were variously distributed along the bottom; they varied from widely separated to thickly concentrated groupings. After dark, the fish were found to have risen to within 3 to 5 fathoms of the surface. The thickness of the schools varied from 2 to 12 fathoms.

Two 1-hour sets were made on those soundings with a midwater trawl. The trawl was capable of catching herring but not specifically designed for catching very small fish. Six bushels of herring averaging 5 inches in total length were retained in the small-mesh cod-end in the first tow and one bushel was taken in the second. The largest school sounded in that area was approximately 2 miles in length. Another smaller, less dense school of approximately $1\frac{1}{4}$ miles length was sounded 3 miles to the eastward of the first school.

A shallow surface school of small-herring was observed during the night of February 13 in a position approximately 2 miles SW. of Matinicus Rock. These fish could not be detected with sounding gear because apparently none of them were deep enough to pass under the vessel.

No further significant midwater or off-the-bottom traces of sardines were found. Four out of five bottom tows in the Toothaker Ridge area produced small quantities of sardines, although none of those had been detected on the sonic equipment. In general, the sardines were about the size of the inshore herring, although taken from deeper water. Their average length was about 5 inches and their length range was from about 4 to 7 inches.

Only one large "sea herring" was taken and that was during a bottom tow at 80 fathoms depth.

Note: See Commercial Fisheries Review, Dec. 1961 p. 41.

* * * * *

NEW VESSEL PLANNED TO REPLACE M/V "DELAWARE";

Work on designing a new stern trawler for year-round exploratory fishery research in the Northwest Atlantic by the U. S. Bureau of Commercial Fisheries will begin at once, the Department of the Interior reported today.

The vessel will replace the 24-year-old Delaware which now is used as an exploratory fishing and gear research vessel by the Bureau. The new vessel, 125 to 150 feet long, will be designed as a more efficient exploratory craft and will, like the Delaware, be based at Gloucester, Mass.

George G. Sharp, Inc., marine designers of New York City, has been awarded a contract for preparing plans and specifications for the vessel.

The deck and gear arrangement will feature a mechanical and, as far as possible, automated method of handling otter-trawl fishing gear. It will also be adaptable to methods of fishing other than trawling, such as long-lining, gill-netting, and purse-seining.

The deckhouse and the below-deck arrangements will conform to the specialized requirements of marine researchers. Adequate space and facilities are to be provided for fish-finding devices and other electronic equipment. Laboratories and living accommodations for as many as seven scientists will be provided on the main-deck and second-deck areas.

Design of the vessel is expected to require approximately eight months. Construction will begin shortly thereafter.



North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE
FAUNA OFF MOUTH OF COLUMBIA RIVER:

M/V "John N. Cobb" Cruise 53: The U.S.
Bureau of Commercial Fisheries announced

a cruise (February 26-March 23, 1962) of its exploratory fishing and gear research vessel John N. Cobb to sample marine bottom fauna in waters south of the Astoria Canyon and west-southwest of Tillamook Head, Oreg., in 50 to approximately 700 fathoms of water and west of Destruction Island between Cape Elizabeth and Umatilla.

The primary purposes of the cruise were (1) to monitor marine fauna at stations along a previously established track line off the mouth of the Columbia River and to collect samples for radiological analysis by the Laboratory of Radiation Biology at the University of Washington, and (2) to locate stations west of Destruction Island suitable for future re-surveying. The cruise would provide information on the seasonal distribution and abundance of demersal fish and invertebrates in the survey areas, as well as basic information on latent marine resources. Records were to be maintained of oceanographic and meteorological conditions as well as bottom topography. Biologists from the Oregon Fish Commission expected to tag Dover sole caught in deep water to study their rates of growth and migratory habits. The National Museum was to collect rare species of fish during the survey.

A standard otter trawl net was to be towed for one hour to sample marine life at each trawlable station. Sonic equipment was to be used as an aid in locating trawlable bottom.

Note: See Commercial Fisheries Review, Sept. 1961 p. 35, Nov. 1961 p. 26.



North Pacific Fisheries Investigations

BUREAU GETS NEW RESEARCH VESSEL:

Permission was received late in 1961 to proceed with the procurement of a 175-foot vessel (coastal refrigerator and supplytype) for high-seas research in the North Pacific Ocean. As of December 28, 1961, the vessel was officially released by the U. S. Navy to the U. S. Bureau of Commercial Fisheries.

In conjunction with the Bureau's new vessel, continued charter of private vessels is contemplated. A contract has been signed with the owners of the Bertha Ann for a 75-day high seas research cruise in the North Pacific.



Oceanography

NEW OCEAN SURVEY TO COVER AREA NEAR BAHAMA ISLANDS:

On the first leg of a six-months oceanographic survey of the area between the "Sargasso Sea," Virginia Capes, and Puerto Rico, the Survey ship Explorer sailed from Norfolk, Va., on February 19, 1962, the Coast and Geodetic Survey, U. S. Department of Commerce, announced in February. The objective of the project for 1962 is to probe more than 250,000 square miles of the dangerous "Hurricane Belt" north of Puerto Rico and east of the Bahama Islands before the autumn storms arrive.



Fig. 1 - Coast and Geodetic Survey ship Explorer.

Plans call for 52 oceanographic probes to study the physical, chemical, geological, and magnetic aspects of the ocean environment. One "station" will be directly over the 30,000-foot Bronson Deep, believed to be the greatest depth in the Atlantic Ocean.

The Agency's oceanographers are confident that this systematic survey will produce an unprecedented assortment of data on currents, bottom topography, sound velocity structure, water chemistry, and the earth's magnetic field. At 23 of the oceanographic "stations," bottom sediment cores will be taken and preserved in plastic tubes for future examination.

The Coast and Geodetic Survey has a long record of oceanographic investigations along the continental shelf of the United States and in the waters around Puerto Rico. In the 1870's, the Survey made a thorough

study of the complex Gulf Stream. But the work planned this year is the first effort to methodically comb the vast area joining the western boundary of the "Sargasso Sea." Here the brown Sargasso weed is found floating in great masses in what oceanographers term a region virtually devoid of major ocean currents.



Fig. 2 - Preparing Nansen bottle for lowering to record temperature and test the salinity of sea water.

The 220-foot Explorer carries a complement of 12 officers, 77 crewmen, and additional scientific personnel. The ship is outfitted with precision depth-recorders, a Loran C navigational control system, and a maze of oceanographic equipment for taking water temperatures, salinity, and water samples; measuring weather and sea swell conditions; and recording variations in the earth's magnetic field. A torpedo-shaped instrument known as the Varion Proton Magnetometer is towed about 500 feet astern at all times while the ship is under way.

In an effort to learn more about ocean currents, the Explorer will release more than 5,000 drift bottles during the cruise. These will drift freely with the current--perhaps finding their way to the beaches of

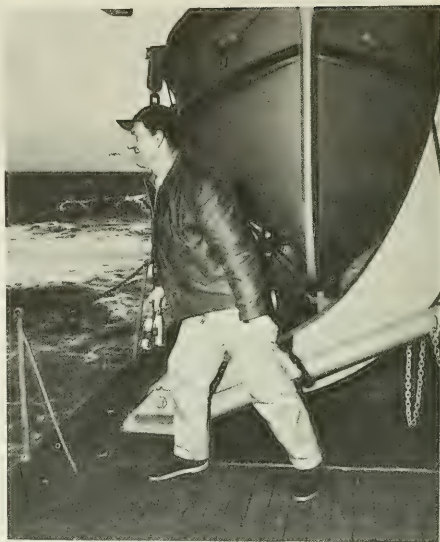


Fig. 3 - Tossing a drift bottle over the side of the Explorer.

the United States, Great Britain, or France or remaining adrift at sea for years. A card, tucked neatly inside the "pop"-sized bottle, asks the finder to mark on it the time and place he found the bottle and to send the card to the U. S. Coast and Geodetic Survey headquarters in Washington, D. C.

The oceanographic work will be accomplished during the passage of the Explorer from her home port of Norfolk to the 1962 working area around the Island of Puerto Rico. Throughout the season, the ship will remain in the coastal waters of Puerto Rico, undertaking hydrographic work for six-week periods, and then return to Norfolk for about two weeks. This should permit about six deep-sea sounding lines to be run about 60 miles apart. Eventually, the line spacing will be reduced to 10 miles to meet ocean survey specifications. New hydrographic work around Puerto Rico has been scheduled this year as part of the Coast and Geodetic Survey's basic nautical charting program.

Oceanographic studies such as the one to be undertaken by the Explorer during

1962 are becoming increasingly vital to the nation's commerce and defense. Part of the area to be probed, east of the Bahama Islands, is part of the Cape Canaveral down-range tracking area.

* * * * *

GRANT FOR SERIAL ATLAS OF NORTH ATLANTIC MARINE ENVIRONMENT:

A grant of \$47,660 from the National Science Foundation for support of a Serial Atlas of the Marine Environment of the North Atlantic was received by the American Geographical Society. The atlas project is being undertaken in cooperation with other scientific institutions here and abroad. The atlas will be issued as individual folios, in much the same way that a journal is published. Unlike a journal, however, it will have no regular publication dates. The announcement of the grant was made by the Society on February 22, 1962.

The first folio of the atlas, "Sea Surface Temperature Regime of the Western North Atlantic, 1953-54," is to be published this spring. It consists of 55 maps showing a great volume of surface temperature observations collected by commercial vessels at sea and bringing out detailed, month-to-month patterns of differences in surface temperature. The author is a meteorologist with the U. S. Bureau of Commercial Fisheries.

Maps and preliminary data for three other folios have been submitted. These include a study of the biogeography of the clam Spisula polynyma by an employee of the U. S. Bureau of Commercial Fisheries; average temperature at a depth of 200 meters (the depth at which temperatures remain constant throughout the year), by a member of the Woods Hole Oceanographic Institution; and a study of the distribution of more than 130 species of fish found off Georges Bank between Cape Cod and Nova Scotia.

Each folio of the atlas will consist of a map or series of maps dealing with an aspect of oceanography. As the folios grow in number, the atlas is expected to present a comprehensive range of studies in all disciplines dealing with the sea. By pointing up comparisons and patterns and by showing up gaps in knowledge, the atlas may also serve as a guide for future research.

Nineteen base maps, each covering a section of the North Atlantic and Arctic Ba-

sins, have been compiled by the Society. These are issued to scientists, on request, for use as work sheets on which the scientists' own findings are plotted. Each study is evaluated by a panel of experts and the society's cartographers prepare finished maps for publication. More than 200 individual scientists in 20 countries have so far requested one or more of the base maps.

Note: See Commercial Fisheries Review, May 1961 p. 19.



Oysters

RESEARCH PROGRESS ON MORTALITIES:

Research progress on heavy oyster mortalities that have occurred for the past few years in certain Middle Atlantic areas was summarized at a conference at Solomons, Md., on January 23 and 24, 1962. Forty scientists met at the University of Maryland's Chesapeake Biological Laboratory for their Fourth Annual Conference on this topic. They exchanged ideas and information on the parasites causing the losses. The biologists represented various universities and state and Federal agencies of the Gulf, Atlantic, and Pacific Coasts.

On balance, the present situation was found to be moderately encouraging. No new spread of the MSX oyster blight was reported, the beginnings of recovery were noted in Delaware Bay, and understanding is emerging on the use of waters of low salinity in protecting oyster production. Knowledge of various imported parasites is rapidly increasing. On all of these points and others, however, scientists stated the urgent need for additional knowledge.

Oyster losses along the Middle Atlantic Coast were the major topic of discussion. Biologists from Delaware Bay report improved survival of native oysters in 1961, and suggest that resistant strains may be developing. Total production will, however, remain very low. The Virginia scientists report little change in the mortality pattern. Heavy losses continue and as yet show no indication of decreasing in the lower Chesapeake areas, which have been affected.

The scientists are glad to find that their pooled information indicated no new spread of the blight. Research in the laboratory and in the natural environment supports the idea that low salinity protects oysters from MSX.

The conference yielded much new information about several of the causes of oyster losses and showed rapid advance in knowledge since MSX was discovered in 1957. Detailed discussions were concerned with the possible life history of this organism, the methods of transmitting MSX into oysters, the other parasites which have recently been discovered, and the best methods of developing resistant strains.

At the end of the conference, suggestions were made for future research. These included thorough studies on the distribution of parasites and mortalities, laboratory tests of the effects of low salinity, research on the life histories of parasites, tissue-culture studies of effects of parasites on oyster, further checks to understand the methods by which oysters are infected, and increased attention to the production of resistant strains of oysters.



Preservation

REVIEW OF STUDIES TO EXTEND STORAGE LIFE OF FRESH FISHERY PRODUCTS BY IRRADIATION:

The use of irradiation as a means of extending the storage life of fresh fishery products has been under study jointly by the U. S. Bureau of Commercial Fisheries and the U. S. Atomic Energy Commission. On February 2, 1962, in the Department of Food Technology at the Massachusetts Institute of Technology, Boston, Mass., there was a demonstration of preserving fresh fishery products by irradiation. The occasion of the demonstration was a meeting of a special committee of the National Fisheries Institute designated to review the progress that has been made by the Atomic Energy Commission in its investigation of the use of radiation as a means of locking in and preserving the ocean-fresh flavor of fresh fish and shellfish.

The demonstration consisted of exposing fresh-caught haddock to radiation from a cobalt-60 radiation apparatus.

After this demonstration, the conference group, consisting of scientists and prominent members of the fishing industry, traveled to Gloucester, Mass., where taste tests were conducted, the group enjoying the taste of

haddock and clams that had been irradiated by cobalt-60 rays more than three weeks earlier. The taste tests were conducted at the Bureau's Technological Laboratory in Gloucester.

The Bureau's Technological Laboratory, which conducts studies of the physical and chemical factors that affect the flavor and odor of fish and shellfish, is hopeful that the demonstration of irradiation preservation methods may prove to be a significant milestone of progress in the Bureau's efforts to help the fishing industry provide attractive ocean-fresh fishery products for the American table.

Note: See Commercial Fisheries Review, Feb. 1961 p. 25.



Salmon

MORE CHINOOK EGGS TAKEN AT COLUMBIA RIVER HATCHERIES IN 1961:

A total of approximately 65 million eggs from fall chinook or king salmon were taken at the Bureau's Columbia River Fisheries Development Program hatcheries in 1961. This is an increase of about 2,350,000 eggs over the number taken in 1960. Fish hatched and reared from the eggs will be liberated in the Columbia River and its tributaries this spring (1962).

In coordination with the rearing and release of these hatchery fish will be a large-scale program of marking of young fish in order to evaluate hatchery production. Approximately 5,750,000 fingerlings will be marked by excision of fins. The marking will be conducted at all program hatcheries rearing fall chinook salmon, and it is expected that most of the work will be done this spring, just prior to the release of the fish.

* * * * *

STUDY OF HOW JUVENILE KINGS MIGRATING DOWNSTREAM REACT TO LARGE DAMS:

The first phase of a cooperative state and Federal three-year study of how juvenile king salmon migrating downstream react to large reservoirs began the latter part of February 1962 when 750,000 hatched salmon were released in a tributary of Shasta Lake. The fish were supplied by the

Coleman National Fish Hatchery and planted by California's Department of Fish and Game.

Primary objective of the study is to find out how large impoundments such as Shasta Lake affect the young salmon's ability to migrate downstream to the ocean. The information is needed to help evaluate the overall effects of proposed large dams on salmon resources in California and other western states.

Fisheries biologists note that getting adult salmon around the proposed dams so they can spawn in upstream tributaries is only half of the problem. They point out the possibility that the young salmon would not negotiate the reservoir to the dam area where they could be bypassed to the river below. This, they note, would either substantially reduce or entirely eliminate valuable salmon runs.

The study is being supported financially by California's Department of Water Resources and the U. S. Fish and Wildlife Service. California's Department of Fish and Game is conducting the study and will be operating sampling nets in Shasta Lake for the next two years.

POND-REARED SILVERS RELEASED INTO THE COLUMBIA RIVER:

Nearly 40,000 yearling silver salmon were liberated into the Columbia River early in March at the conclusion of the Oregon Fish Commission's first season of natural pond-rearing salmon activities at Wahkeena Pond, a 20-acre impoundment bordering the Columbia River highway U. S. 30, a mile west of Multnomah Falls, Multnomah County.

In an experiment to test the feasibility of raising salmon fingerlings in natural ponds without the benefit of artificial feeding, the pond was stocked with 101,000 silver fingerlings in May 1961. During the ensuing months the young fish fed only on insects and other natural foods available in the impoundment.

The Commission in charge of the pond-rearing experiment termed results of the first season's test "most promising." On the basis of the limited experiments in pond-rearing to date, a survival of 30 percent of the fingerlings stocked to the yearling release size is considered good. With 39,900 silvers counted out, the Wahkeena program

has resulted in a 40 percent survival rate. The young salmon average 4 inches in length, about the size of "wild," stream-reared silvers of the same age. Detailed laboratory examination of sample specimens showed the fish to be in excellent physical condition.

Construction of the new fish-rearing lake was financed by Federal funds, made available to the Commission through the provisions of the Columbia River Fisheries Development program. This Federal aid plan is designed to alleviate some of the damaging effects of the Columbia River fisheries due to dam construction on the Columbia River and its tributaries.

Although a small percentage of the fish released during the past few days will return to the Wahkeena outlet this coming fall as "jacks," most of those surviving the rigors of ocean life will return as adult spawners during the fall of 1963.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS AS OF FEBRUARY 15, 1962:

Item and Period	1962	1961	1960	1959	1958
	..... (1,000 Lbs., Heads-Off)				
Total landings, S. Atl. & Gulf States:					
February	1/	3,901	3,785	3,227	4,007
January	4,500	5,677	5,401	4,310	5,254
January-December ..	-	90,560	141,035	130,659	116,532
Quantity used for canning, Gulf States 2/:					
February	1/	98	223	135	52
January	470	199	289	308	146
January-December ..	-	15,760	28,594	24,679	26,404
Frozen stocks (end of each month) 3/:					
February	1/	37,612	29,063	27,555	16,359
January	20,674	37,842	34,332	30,858	17,963
June	-	19,416	15,338	19,283	10,664
November	-	20,668	37,264	37,334	30,211
Imports 4/:					
February	1/	8,932	7,657	7,481	4,466
January	1/	12,338	8,596	8,238	5,896
December	-	15,442	12,411	10,611	10,447
January-December ..	-	126,282	113,418	106,555	85,393

1/Not available.

2/Weights of headless shrimp determined by multiplying the number of standard cases by 33.

3/Raw headless only; other shrimp products not included.

4/Reported by Bureau of the Census. Includes fresh, frozen, canned, dried, and other shrimp products.

Note: Data for 1962 and 1961 are preliminary. January 1962 data estimated from information published in the daily New Orleans Market News Service "Fishery Products Reports."

NUMBER OF GULF OF MEXICO VESSELS TO SHIFT FISHING OPERATIONS TO COLOMBIA:

At least 17 vessels from Louisiana and Alabama early in March 1962 were getting ready to move to South America. Boat owners from Bayou LaBatre, Gulf Shores, and Morgan City, La., were readying a fleet of Gulf shrimp trawlers to move shrimp fishing operations to Colombia.

The shrimp vessels will operate under contract with a Colombian firm. The businessmen making the move said the reason for the move is that "we just can't make it here with these type boats." The boats average 62 to 70 feet in length and are all double-rigged for trawling in the deep waters of the Gulf of Mexico.

The trawlers will each take a skipper and a mate. Each vessel will hire 3 Colombians to make up the crew. The Colombian Government requires each boat to hire 3 Colombians. The vessels will operate out of Buenaventura on the Pacific Coast of Colombia.

"There's been a lot of red tape," the boat owners say, in preparing for the voyage. It has taken more than two months, they report, to get the necessary clearances, working visas, and making other arrangements. The two principal boat owners say the maintenance facilities in Buenaventura are primitive and there are practically no spare parts for engines and equipment. The vessels are even taking extra otter boards because there might be difficulty in replacing them in Colombia.



South Atlantic Exploratory Fishery Program

EXPLORATORY FISHING FOR ROYAL-RED SHRIMP:

M/V "Silver Bay" Cruise 36 (January 15-February 6, 1962): Assessing the seasonal availability of deep-water royal-red shrimp (*Hymenopaeus robustus*) and conducting simulated production fishing for that species were the primary objectives of the 23-day cruise of the exploratory fishing vessel Silver Bay of the U. S. Bureau of Commercial Fisheries. The vessel, which operated along the Florida east coast, returned to Brunswick, Ga., on February 6, 1962.



M/V Silver Bay, Bureau exploratory fishing vessel.

A total of 53 drags was made between St. Augustine and Cape Canaveral in the 160-205 fathom depth range. Best catches were made between latitudes 29°59' and 29°42' north in depths ranging from 160-185 fathoms. In that area individual catches ranged up to 350 pounds (heads-off) of 26-30 count (not graded) royal-red shrimp per 3-hour drag. Twenty-five drags in that area from January 16-21 produced a total of 2,725 pounds (heads off) of royal-red shrimp for an average of 450 pounds per day.

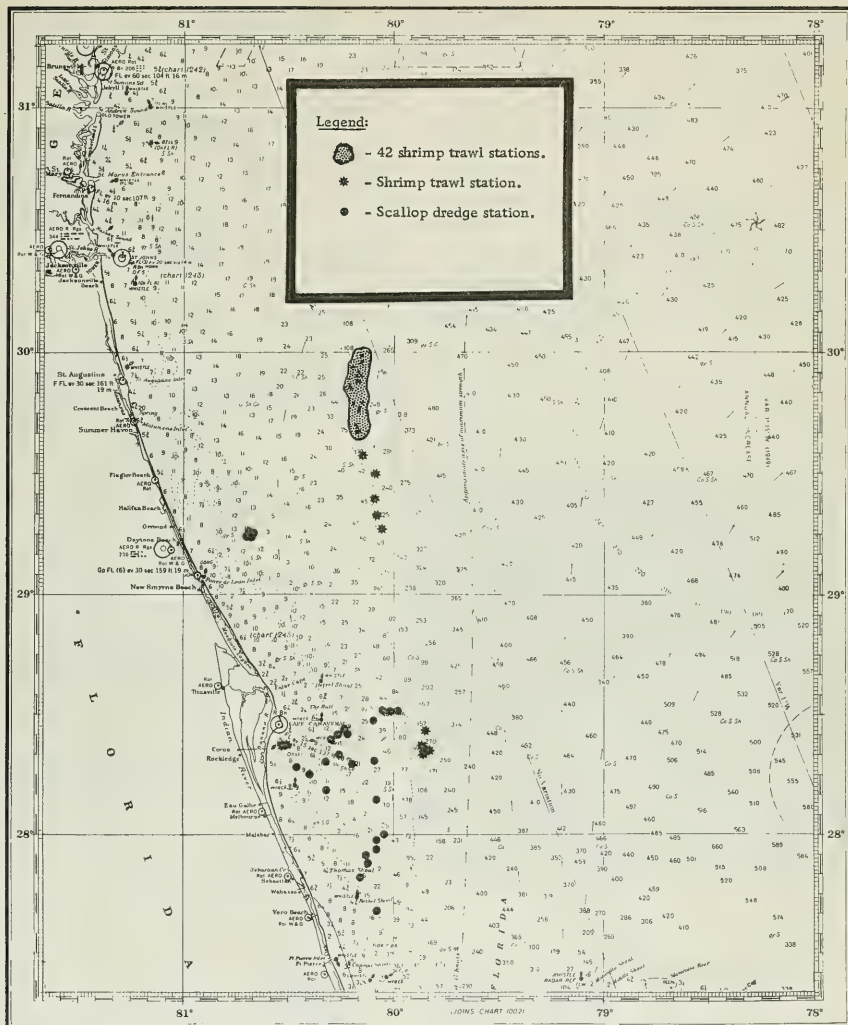


The deep-water royal-red shrimp (*Hymenopaeus robustus*).

Of the various gear combinations tried, the most satisfactory was a conventionally-rigged 80-foot 4-seam flat trawl with 10-foot doors fished on a 30-fathom bridle.

During the last part of the cruise, deep-water shrimp trawling was demonstrated to and conducted with 4 vessels which started to commercially fish royal-red shrimp in the survey area.

Twenty-seven dredge hauls were made on the Cape Canaveral calico scallop bed to obtain samples for Bureau biologists and technologists and to obtain samples and conduct tests for cooperators. High concentrations of scallops were found off Ormand and



M/V Silver Bay Cruise No. 36 (Jan. 15, to Feb. 6, 1962).

Cocoa Beaches with catches ranging up to 36 bushels of live scallops per 30-minute drag. The shell size (50-65 mm.) was medium to large and the meats (85-100 per pound) were in excellent condition.



Underwater Research

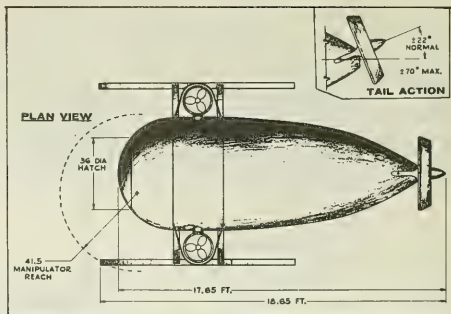
NEW UNDERSEAS RESEARCH VEHICLE DEVELOPED:

A new underseas research vehicle, the Seapup IV, is a two-man vehicle that is designed for simple reliable operation to ocean depths of 6,000 feet, according to the manufacturer. It will hover and rotate and can be maneuvered precisely in vertical, horizontal, and inclined planes. Equipped with the manufacturer's specially adapted mechanical arm, the vehicle can perform manual tasks while hovering or resting on the ocean floor.



Seapup IV, a two-man underseas research vehicle.

Over-all length of the vehicle is 18.65 feet; over-all width, 8.00 feet; total weight, including batteries, lifting fluid, and all other standard equipment, is 12,600 pounds; operational speed is 2 to 4 knots; maximum operating time when submerged is 12 hours. Power available is 15,300 watt hours. Main propulsion is provided by a 2.5-hp. D.C. motor driving a 34-inch shrouded propeller; control or lift propulsion is provided by two $\frac{1}{4}$ -hp. D.C. motors driving two 14-inch shrouded propellers. The main propulsion assembly pivots 70 degrees port or starboard, and thrust from control propulsion assemblies can be directed inde-



pendently to any angle in a vertical plane. The pressure hull is cylindrical with hemispherical ends. It has 4 ports and 1 hatch.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JANUARY 1962:

During January 1962, a total of 24 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 23 in January 1961. Also, there were 19 more documents cancelled for fishing vessels in January 1962 than in the same month in 1961.

Table 1-U.S. Fishing Vessels ^{1/} --Documentations Issued and Cancelled, by Areas, January 1962 with Comparisons			
Area (Home Port)	January		Total 1961
	1962	1961	
..... (Number)			
Issued first documents^{1/}			
New England	2	3	33
Middle Atlantic	-	-	12
Chesapeake	4	3	75
South Atlantic	2	1	44
Gulf	10	11	103
Pacific	6	5	149
Great Lakes	-	-	12
Puerto Rico	-	-	2
Total	24	23	430
Removed from documentation^{2/}			
New England	2	1	20
Middle Atlantic	8	2	32
Chesapeake	2	6	28
South Atlantic	3	5	29
Gulf	13	6	104
Pacific	16	9	111
Great Lakes	5	2	17
Hawaii	1	-	-
Total	50	31	341

^{1/}For explanation of footnotes, see table 2.

Table 2-U.S. Fishing Vessels^{1/}--Documents Issued and Cancelled, by Tonnage Groups, January 1962

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	6	11
10-19	7	15
20-29	1	7
30-39	3	2
40-49	-	3
50-59	1	1
60-69	2	4
70-79	1	-
80-89	1	-
90-99	1	-
130-139	1	-
140-149	-	1
150-159	-	2
280-289	-	1
300-309	-	1
330-339	-	1
420-429	-	1
Total	24	50

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 3 net tons and over.

^{2/}Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 4 in 1962, 14 in 1961, 1 in 1960, 1 in 1957, 1 in 1956, 1 in 1951, and 2 prior to 1951. Assigned to area on the basis of their home ports.

^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

CREDIT INSURANCE FOR U. S. EXPORTERS:

Credit insurance for United States exporters, covering both overseas commercial and political risks, became available on February 5, 1962, through the newly-formed Foreign Credit Insurance Association (FCIA).

Details of the program were announced by the president and chairman of the board of the Export-Import Bank of Washington (Eximbank), and the chairman of the governing committee of FCIA.

In cooperation with the Export-Import Bank, the FCIA will insure in a single policy both commercial credit and political risks on short-term transactions resulting from United States export sales to buyers in friendly foreign countries. This new insurance guarantees payment of credits extended by a United States exporter to a foreign buyer. The policy contains coverage and provisions designed to give American exporters the best service of its kind in the world.

This program will provide two important benefits for exporters. First, exporters will be more disposed to extend credit to customers abroad and, second, they will be better able to obtain more financing from commercial banks than if the accounts were not insured.

Foreign credit insurance does not itself provide the financing required by the insured exporter. Such financing is available from commercial banks and other private financial institutions.

FCIA is an unincorporated association comprised at present of 57 capital stock and mutual insurance com-

panies. Membership is open to all responsible and qualified insurance companies. The insurance will be offered through the member insurance companies and their agents and brokers.

Credit or commercial risks to be covered include insolvency of the buyer and protracted default. Also covered will be political risks of inconvertibility of a foreign currency to dollars, cancellation or restriction of export or import licenses, expropriation, confiscation, war, civil commotion or like disturbances.

This type of insurance has long been offered to exporters in foreign countries, mostly through government agencies, but has been available only on a limited basis to United States exporters.

"This concept of meeting the need for an insurance program through private companies is in keeping with the American free enterprise system," the President of the Export-Import Bank said. "The program enables the exporter to purchase his credit insurance through a local agent or broker and eliminates any need for direct negotiations with Eximbank in Washington."

Coverage will be offered in most foreign nations except for the "iron curtain" countries.

Policies issued by FCIA will have Eximbank underwriting 100 percent of the political risks with FCIA and Eximbank sharing the credit risks with FCIA. Last September Congress enacted legislation clarifying Eximbank's authority to enter such an arrangement with private insurance companies. The bank at the same time was empowered to insure export transactions in an amount up to \$1 billion.



Harold F. Linder, president and chairman of the board of the Export-Import Bank of Washington (left) and Thomas H. Bivin, chairman of the governing committee of the Foreign Credit Insurance Association are shown at a press conference at which it was announced that the new Association will begin operation.

The first FCIA policy will cover all United States products which may be legally exported from the United States on terms of 180 days or less. In appropriate cases, this cover may be had for transactions whose terms are up to one year. As soon as practicable, policies will be made available for export transactions whose terms are as long as five years.

In all cases, terms of repayment in the transaction are not to exceed those customary for the goods in international trade.

The premium rates on short-term policies where all export sales are covered will vary according to the terms of payment and the foreign country of the buyer and they will range from 20¢ to \$1.72 per \$100 of gross invoice value.

Political risk coverage of the FCIA short-term policy is as extensive and inclusive as any to be found among insurers of international trade transactions. For example, FCIA treats any external expropriation or of intervention in the buyer's business as a political risk and it is therefore covered to 95 percent of potential loss. Common practice abroad is to consider expropriation and intervention as simple default of payment with coverage of 85 percent of potential loss. Further, coverage against other acts of government such as war and civil war is broader than is usual in delineating the elements of "political risks." In supporting political risk claims, the exporter will be required to submit the "best evidence reasonably available to the insured," that the loss was covered by the policy.

EXPORTS AND RE-EXPORTS OF FROZEN SHRIMP TO JAPAN:

1961: The Japanese continued to buy small quantities of frozen shrimp in December 1961 in spite of high prices and light supplies.

Of the almost 9.5 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the year 1961, almost 5.8 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

In 1960, almost 3.8 pounds of frozen shrimp were exported and re-exported from the United States--considerably less than the amount reported in 1961. In 1960, only 364,000 pounds of the total were shipped to Japan.

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp to Japan, 1961 and 1960					
Type of Product	1961				1960
	Oct.	Nov.	Dec.	Jan.-Dec.	Jan.-Dec.
Domestic	190	69	122	2,298	259
Foreign	130	245	107	3,481	105
Total	320	314	229	5,779	364
1/Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.					

Exports and re-exports of shrimp to Japan from California were negligible prior to 1961. But due to a short supply of shrimp in Japan during the first part of 1961 and a strong market, that country purchased substantial quantities of shrimp from the United

States. Most of the Japanese purchases consisted of frozen raw headless brown shrimp, 21-25 shrimp to the pound. But some shipments included 26-30 count, 16-20 count, and under 15 count.

January-November 1961: The Japanese continued to buy small quantities of frozen shrimp the latter part of 1961 in spite of high prices and light supplies. Of the almost 8.9 million pounds of domestic and foreign fresh and frozen shrimp exported and re-exported from the United States during the first 11 months of 1961, almost 5.6 million pounds were shipped to Japan. A substantial proportion of the shipments to Japan was made from California. A large percentage of the re-exports consisted of shrimp imported into the United States from Mexico.

U. S. Exports and Re-Exports of Fresh and Frozen Shrimp to Japan, Jan.-Nov. 1961					
Type of Product	1961				
	Aug.	Sept.	Oct.	Nov.	Jan.-Nov.
Domestic	243	17	190	69	2,176
Foreign	254	40	130	245	3,374
Total	497	57	320	314	5,550
1/Although data appear under the "fresh and frozen shrimp" category, it is believed that all of the exports were frozen shrimp.					



Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1962:

A new reference base--1957-59-100--has been introduced in the wholesale price index computed by the Bureau of Labor Statistics of the U.S. Department of Labor. The new base was introduced with January 1962 indexes. The old base of 1947-49-100 has been superseded by the new index base. The new base has been established by the Office of Statistical Standards of the U.S. Bureau of the Budget for use by all Government statistical agencies. Conversion factors can be applied to the indexes prior to January 1962 in order to obtain index numbers which are comparable to those computed under the 1957-59-100 base (table 1).

Inclement weather throughout the country curtailed fishery landings in New England and the Great Lakes and caused disruption in shipments. Consequently the February 1962 wholesale price index for edible fishery products at 119.7 percent (using the new base of 1957-59-100) was 3.9 percent higher than in the previous month and 11.5 percent higher than in February 1961 (table 2).

From January to February 1962, wholesale prices of all items under the drawn, dressed, or whole finfish subgroup rose 8.1 percent. Landings of haddock at New England ports were light and fresh-water fish production in the Great Lakes was hampered by severe winter conditions. Large fresh drawn haddock ex-vessel prices at Boston rose 37.5 percent, New York City prices for fresh yellow pike from the Great Lakes climbed 30.2 percent, and Chicago prices

Table 1 - Conversion Factors to Change Indexes for Edible Fish and Shellfish from 1947-49=100 Base to New Base of 1957-59=100			
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Multiplier 1/
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)			0.8054592
Fresh & Frozen Fishery Products:			0.7129983
Drawn, Dressed, or Whole Fish:			0.7021239
Haddock, lge., offshore, drawn, fresh	Boston	lb.	0.7707129
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	0.9559214
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	0.6217294
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	0.6019765
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	0.6984324
Processed, Fresh (Fish & Shellfish):			0.7156489
Filletts, haddock, sm1., skins on, 20-lb. tins	Boston	lb.	0.7136485
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	0.7416869
Oysters, shucked, standards	Norfolk	gal.	0.6813278
Processed, Frozen (Fish & Shellfish):			0.7853917
Filletts: Flounder, skinless, 1-lb. pkg.	Boston	lb.	0.9680282
Haddock, sm1., skins on, 1-lb. pkg.	Boston	lb.	0.9337068
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	0.8701748
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	0.7685246
Canned Fishery Products:			0.9861663
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	0.8353443
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	1.2317799
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	0.9670401
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	1.2053840

1/To convert 1947-49=100 base indexes to 1957-59=100 base, multiply each item by the multiplier indicated.

Table 2 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1962 With Comparisons							
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)		
			Feb. 1962	Jan. 1962	Feb. 1962	Jan. 1962	Dec. 1961/3/
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.7	115.2	107.4
Fresh & Frozen Fishery Products:					118.5	112.4	106.5
Drawn, Dressed, or Whole Fish:					118.6	109.7	102.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.10	107.4	78.1	109.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.37	117.3	110.4	105.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.86	120.5	120.5	127.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.78	.74	115.7	110.5	94.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.74	.57	120.4	92.5	104.0
Processed, Fresh (Fish & Shellfish):					125.4	117.9	115.6
Filletts, haddock, sm1., skins on, 20-lb. tins	Boston	lb.	.45	.36	109.3	87.4	76.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	.94	123.1	110.2	107.2
Oysters, shucked, standards	Norfolk	gal.	7.75	7.88	130.7	132.8	126.5
Processed, Frozen (Fish & Shellfish):					107.7	105.5	105.0
Filletts: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	97.6
Haddock, sm1., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	96.7	96.7	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.33	119.2	115.7	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.95	.92	112.1	108.5	83.0
Canned Fishery Products:					122.1	120.4	120.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.00	124.2	122.0	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	107.9	107.9	97.7
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.15	118.5	116.2	112.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	12.81	12.31	164.3	157.9	157.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100. Conversion factors can be applied to the indexes prior to January 1962 in order to obtain index numbers which are comparable to those computed under the 1957-59=100 base.

3/Recomputed to be comparable to 1957-59=100 base indexes.

Note: January 1962 and December 1961 indexes published in Commercial Fisheries Review, March 1962 p. 27 and February 1962 p. 48 were on the old base of 1947-49=100.



Unloading a refrigerated trailer loaded with imported frozen fillets at Fulton Market, Chicago, Ill.

for fresh drawn whitefish from Lake Superior were 4.7 percent higher. With cold-storage stocks at a relatively low level, frozen Western halibut prices at New York City also rose 6.3 percent. Compared with a year earlier, February 1962 prices in the subgroup were 5.5 percent higher. Fresh haddock prices at Boston were 38.6 percent higher and Western halibut prices were up 24.0 percent. To offset the increases slightly was the 5.5-percent drop in the prices of frozen Western king salmon due to more being available and a certain amount of consumer resistance to higher prices.

Fresh processed fishery products prices rose 6.4 percent from January to February 1962. Fresh haddock fillet prices at Boston were up 25.1 percent because of the scarcity of fresh haddock. Also, fresh shrimp prices at New York City continued to climb and rose 11.7 percent because of very light landings. More plentiful supplies and a slight drop in demand caused fresh shucked oyster prices at Norfolk to drop 1.6 percent, but this was before the damaging March high tides hit most of the oyster areas on the Atlantic Coast. Compared with February 1961, processed fresh fish and shellfish prices this February were up 13.1 percent. This increase was the result of an increase (34.3 percent) in the price of fresh haddock fillets at Boston and an increase (20.1 percent) in fresh shrimp price at New York City. Both fresh haddock fillets and fresh shrimp were scarce this February.

Prices for processed frozen fish and shellfish in February 1962 were 2.1 percent higher than the previous month



principally because of higher prices for frozen ocean perch fillets (up 3.0 percent) and frozen shrimp at Chicago (up 3.3 percent). Compared to the same month last year, February 1962 prices were up a substantial 16.1 percent. The continued scarcity of frozen shrimp was responsible for the 35.1-percent increase in the Chicago price for frozen shrimp. Lighter supplies of frozen ocean perch fillets caused the price at Boston to rise 11.5 percent. Offsetting these increases were lower prices (down 8.3 percent) for frozen flounder fillets at Boston.

The short supplies of canned fishery products were reflected in higher prices. The index for the canned fishery products subgroup started to rise again (up 1.4 percent) in February 1962, with canned pink salmon prices up 1.8 percent, canned California sardine in tomato sauce prices up 2.0 percent, and canned Maine sardine prices up 4.1 percent. The 1961/62 season for California sardines ended on February 28 with the pack behind the small pack in 1960. Maine sardine stocks continued to dwindle and demand exceeded the available supplies. Canned pink salmon stocks also were at a low level. Canned tuna stocks were moderate and demand was good, but there was no significant change in prices except that some trade discounts were reported in advertised brands. February 1962 prices for canned fishery products were up a substantial 11.7 percent. All products (except for canned salmon) in the subgroup were priced substantially higher this February: canned Maine sardine prices were up 50.6 percent, canned California sardine prices were up 34.7 percent, and canned tuna prices were 10.4 percent higher.



SHRIMP IN UNITED STATES FIRST CANNED IN 1867

"Shrimp were first packed in the Gulf of Mexico area. G. W. Dunbar of New Orleans canned shrimp as early as 1867 but had difficulty with blackening and discoloration. He solved this problem in 1875 with the invention of a can lining which aided greatly in overcoming blackening. Shrimp packing soon became the principal fishery canning industry of the Gulf Coast."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 7, p. 4,
U. S. Fish and Wildlife Service

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 11--

A GREAT LAKES STERN-RAMP TRAWLER:

Gill-net vessels have long been the mainstay of the Great Lakes fishing fleet. The characteristic and unique superstructures of the vessels have been designed to protect their low decks from boarding seas and their crews from bad weather. Early in 1958, owners began converting some of the gill-net vessels to otter trawlers (Gordon and Brouillard 1961). Conversion required removal of much of the protective superstructure from each vessel to make way for the mast, boom, and overhead tackle used in conventional otter trawling operations. Some owners were disturbed at the exposure of decks and crews that resulted.

A method of trawling was needed that could be adapted readily and relatively inexpensively and that would permit operations from gill-net vessels without removing from them the existing superstructures or decking. One such method, suitable for use with many gill-net vessels, has been found in stern-ramp trawling.

In stern-ramp trawling, the net is hauled over a hydraulic stern ramp through an opening in the stern and wound on a drum. No overhead gear is needed, and there is no necessity for removing the superstructure.

EQUIPMENT AND GEAR

A relatively simple deck arrangement has been developed for gear handling (fig. 1). Deck equipment consists of winch, net drum, net roller, and stern ramp. The winch is mounted amidships, aft of the pilothouse, with its drums facing wing bollards mounted in each bulwark. Trawling warps lead from the drums, through the wing bollards, aft along each side, through towing blocks attached to davits on each stern quarter, and outboard to the trawl doors. Warp ends remain shackled to the trawl doors throughout the net-handling operation.

The net drum, similar in design and construction to those used aboard some Pacific

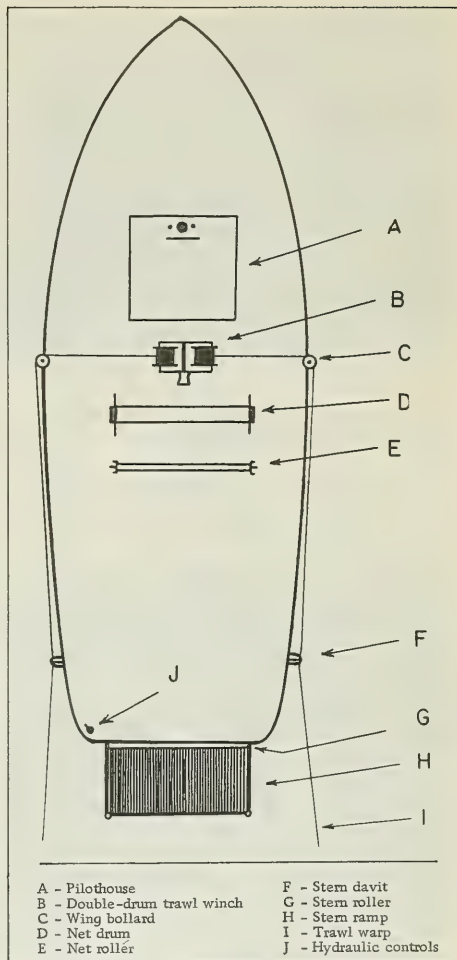


Fig. 1 - Topside view of deck arrangement of a stern-ramp trawler.

Northwest trawl vessels (Alverson 1959, Wathne 1959), is mounted just aft of the winch. The net bridle is attached to the drum by pennants mounted in the center of the drum

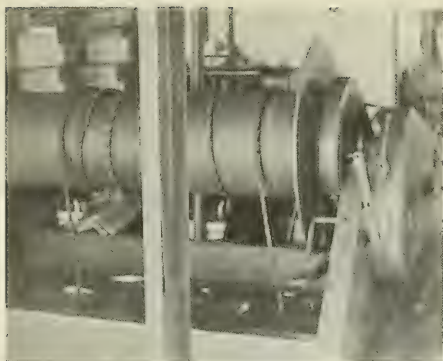


Fig. 2 - The net drum. Pennants are attached to the center of the drum core for attaching the net bridle to the drum. The net roller stanchion is in the foreground.

core (fig. 2). This arrangement provides for fairleading the dandyline gear and trawl and reduces the danger of fouling the net on the stern ramp.

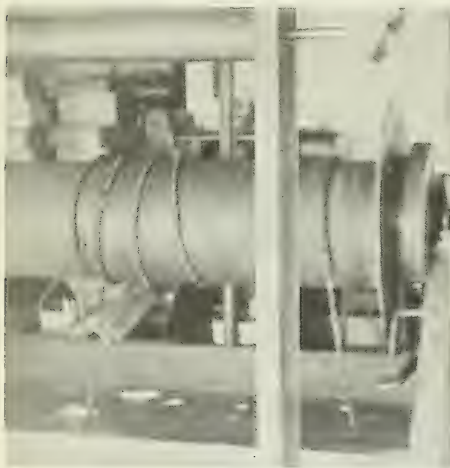


Fig. 3 - The net roller in a raised position. As the cod end of the net passes over the raised roller, the catch is spilled on deck.

The net roller (fig. 3) is used to spill the catch in the limited confines of the enclosed vessel, thereby taking the place of the conventional mast, boom, and overhead tackle.

The roller is installed in channel-iron stanchions directly aft of the winch. Slides and bearing slots cut into the sides of the stanchions (fig. 3) allow manual adjustment of roller height. The roller is lowered during setting and raised to empty the cod end.

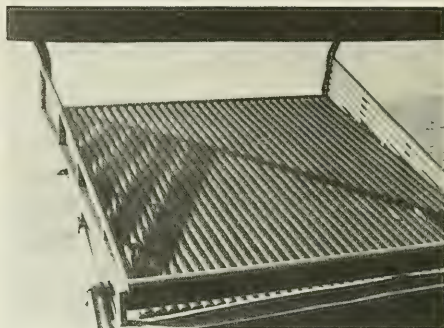


Fig. 4 - The stern ramp. Two double-acting hydraulic rams are used to raise and lower the ramp. The roller in the foreground is mounted on top of the stern bulwarks to aid in setting and hauling the net.

The stern ramp (fig. 4) is hinged to the hull directly below the stern opening, outside the bulwarks. Ramp construction is of channel iron, sheet iron, half-round flat stock, and pipe. Two double-acting hydraulic rams are used to raise and lower the ramp. Hydraulic controls for the rams are mounted under the bulwarks near the stern (fig. 5). A 4-inch pipe roller, mounted on the stern rail just above the ramp, reduces friction and gear wear during setting and hauling.

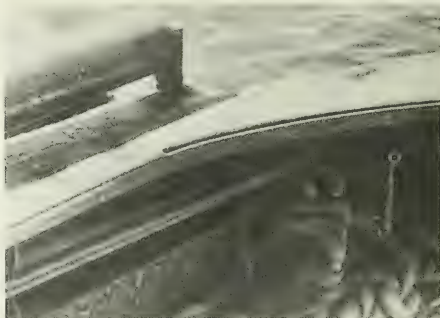


Fig. 5 - Controls for the hydraulic stern ramp rams are located near the stern bulwarks.

Winch and net drums are powered by a mechanical drive. The hydraulic rams are powered by a positive-displacement, belt-driven pump attached to the auxillary engine.

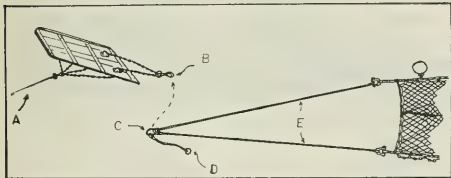


Fig. 6 - The dandyline hookup and arrangement of door connections and warp. (A) Trawling warp (B) Safety hook (C) Bridle ring (D) Pennant idler (E) Legs of dandyline bridle.

Trawl gear used in stern-ramp trawling is the same as that commonly used in the Great Lakes trawl fishery, except that the conventional dandyline hookup described by Knake (1958) has been modified somewhat. The usual 10- to 15-fathom bridles are used between doors and net, but the bridles are connected to the doors with simple chain backstraps that end in heavy-duty safety hooks (fig. 6) rather than with the usual Kelly eyes, stopper links, and shackles.

HANDLING THE GEAR

Setting the Net: (1) The stern ramp is lowered to the water, and the trawl drum is released. (2) The net unwinds from the drum and passes outboard over the ramp (fig. 7). (3) The bridles follow the net off the drum, but they are held by the drum pennants. (4) Safety hooks attached to the chain backstraps on the trawl doors are attached to the bridles; the pennants are slacked off; and the strain of the bridles is shifted to the doors. (5) The pennants are then unhooked, and the rest of the set is completed following standard otter trawling procedure. (6) When the desired amount of warp is out, the stern ramp is raised from the water to reduce drag.



Fig. 7 - Setting the net. The stern ramp has been lowered to the surface of the water.



Fig. 8 - Hauling the gear. The bridle and net are easily led to the net drum.

Hauling the Net: (1) The trawl doors are hauled back to the towing blocks; winch drums are locked; and the stern ramp is lowered to the water (fig. 8). (2) The drum pennants are reattached to the bridles and are wound in on the drum until the strain of the bridles is off the doors. (3) The safety hooks are removed from the bridle rings, and the bridles are wound on the drum. (4) As the net follows the bridle onto the drum (fig. 9), the ramp is

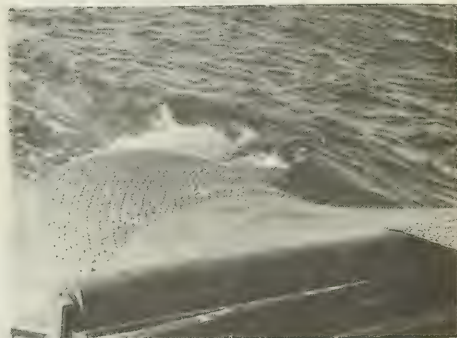


Fig. 9 - The cod end of the net positioned over the ramp prior to being brought aboard.

lowered further until its after end is several feet under the water. (5) When the intermediate section and cod end of the net are directly over the ramp the drum is stopped, and the ramp is raised until it slopes above deck level. (6) The net drum is started again, and the catch in the cod end is hauled aboard (figs. 10, 11). (7) When the intermediate section of the net is over the net roller, the drum is stopped once more, the cod end is

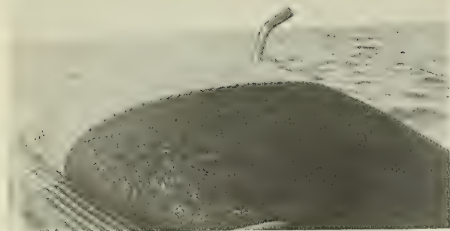


Fig. 10 - The stern ramp is raised so that it slopes above deck level and the catch, in the cod end, is brought aboard.

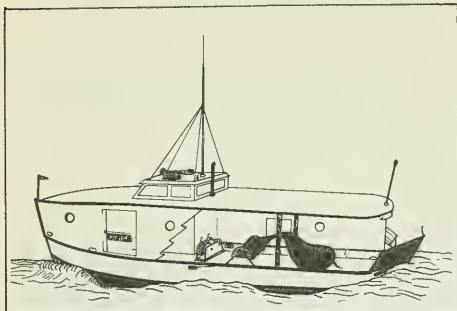


Fig. 11 - Cutaway view of the after deck of a stern ramp trawler showing arrangement of the deck equipment. The net roller is in its raised position.

opened, and the net roller is raised to a height of about 5 feet. (8) Further turns of the drum draw the cod end over the roller, raising it, and spilling the catch on deck.



ADVANTAGES OF STERN-RAMP TRAWLING

Great Lakes stern-ramp trawling has several advantages over conventional trawling methods: The need for mast and boom is eliminated; rigging for net handling is reduced; the net and catch can be handled rapidly with little labor, for the catch need not be split; and the gear can be handled safely during rough weather, since the vessel is enclosed and the vessel headway is always maintained.

LITERATURE CITED

- ALVERSON, DAYTON L.
1959. Trends in Trawling Methods and Gear on the West Coast of the United States. Modern Fishing Gear of the World, pp. 317-320. Fishing News, London.
- GORDON, WILLIAM G. and BROUILLARD, KEITH D.
1961. Great Lakes Trawler Conversion. U. S. Bureau of Commercial Fisheries, Fishery Leaflet 510, 15 pp.
- KNAKE, BORIS O.
1958. Operation of North Atlantic Type Otter Trawl Gear. U. S. Bureau of Commercial Fisheries, Fishery Leaflet 445, 15 pp.
- WATHNE, FRED
1959. Pacific Coast Drum Trawling. Commercial Fisheries Review, vol. 21, no. 12 (December), pp. 34-36 (Also Separate No. 573).
- Note: Appreciation is extended to Capt. William Kunesh of the stern-ramp trawler Avis J. for providing the opportunity to photograph and observe stern-ramp trawling procedures.

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International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1962:

Fishing for halibut will begin May 9 (at 6 p.m.) in all North Pacific areas (areas 1, 2, and 3A) except in Bering Sea (Area 3B North) and waters west of the Shumagin Islands (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1962 fishing season.

March 28 was the opening date for fishing in Area 3B North and April 19 the opening date in Area 3B South. This year fishing began earlier than last year in all areas. (Last year all areas were opened to fishing May 10 except for Area 3B North which opened April 10 and Area 3B South which opened April 25.)

Fishing areas: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North--waters in Bering Sea. The only change in areas from 1961 is that the waters south of Willapa Bay, hitherto divided into Areas 1A and 1B, is treated as a single area, Area 1.

The opening and closing hours of the various regulatory areas is 6 p.m. Pacific standard time of the date indicated. (Last year, 6 a.m.)

In Area 1 the fishing season, with no catch limit, shall terminate at the same time as that in Area 2. (Last year when this consisted of two areas, that part designated Area 1A was open to fishing to October 1 or to the date on which Area 3A closed, whichever was later.)

In Area 2 the fishing season shall terminate at the time of attainment of the catch limit of 28 million pounds (the quota is the same as last year).

In Area 3A the fishing season shall terminate at the time of attainment of the catch limit of 33 million pounds (the quota is the same as last year).

In Area 3B South the fishing season, with no catch limit, shall end September 30 or at the closure of Area 3A, whichever is the later (the closing date last year was October 1).

In Area 3B North the fishing season, with no catch limit, shall end October 15 or at the closure of Area 3A, whichever is later (the closing date last year was October 1.)

The Commission will provide 10 days notice of closure of Areas 1 and 2, and 18 days notice of the closure of Area 3A.

This year the Commission's regulations provide that any fishing vessel leaving Area 3B South, and having halibut aboard, must have its chute and gurdy (gear used for hauling in the line and boating the halibut) sealed before leaving Area 3B South. Authorized Customs or Fishery Officers will apply the seals, and the seals will be removed only by authorized officers at the port where the vessel's fare is to be landed.

The Commission's recommendations for the 1962 season were announced on February 16 at the conclusion of its thirty-eighth annual meeting at its headquarters at the University of Washington, Seattle, Wash., with Chairman William M. Sprules of Ottawa, Ontario, presiding.

Other members of the Commission are Mattias Madsen, William A. Bates, and Harold E. Crowther, representing the United States; and Harold S. Helland and Richard Nelson, representing Canada.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 30 years of Commission management, there has been progressive improvement of the stocks and increase in annual yield. The annual catch, which had declined to 44 million pounds in 1931 the year before regulation, has averaged more than 71 million pounds during each of the past three years. The 1961 catch of about 70 million pounds was worth over \$14.5 million ex-vessel.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff. It also dealt with administrative matters and approved a research program for 1962. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners', and dealer's organizations. The scientific findings and all suggestions for regulations in 1962 were discussed at meetings.

The Commission also announced that the 1963 annual meeting will take place at Petersburg, Alaska, commencing January 29, 1963.

Harold E. Crowther of Washington, D. C., was elected Chairman and Dr. William M. Sprules of Ottawa, Ontario, Vice Chairman for the ensuing year.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1962 regulations as recommended by the Commission will be approved by the two Governments.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

REPORT BY U. S. OBSERVER OF SECOND ANNUAL CONFERENCE:

The second annual conference of the International Association of Fish Meal Manufacturers, held in Lisbon, Portugal, October 25-27, 1961, was attended by an observer from the United States--a technologist of the U. S. Bureau of Commercial Fisheries. This is a report of the conference by that observer.

International (Contd.):

Much of the subject matter fell within the responsibilities of the Scientific Subcommittee of the Association. This report summarizes briefly the technical matters discussed at those committee meetings and also refers to discussions held in the Main Session in regard to fish flour.

There was considerable discussion about feed formulation and how the electronic computer has brought about changes in preparing these formulations. Those concerned with preparing formulas for feed mixes have often been inclined to make few changes in their formulas but now that computers are becoming more readily available, in some countries at least and particularly in the United States, the feed formulations may be modified at fairly frequent intervals to take advantage of price changes of ingredients and other factors favorable to the use of particular feed components in the mixes. It was brought out that much more must be known about fish meal quality and composition before consistently reliable results can be obtained from electronic computers. The answer given by the computer is no better than the information fed into it. There is still a great deal to be learned about processing variables; availability of amino acids in the meal; effect of storage conditions on fish meal; variability in the chemical makeup of the meals; and other factors that will effect the quality of fish meal and determine the extent of its use in feed formulations. Fish meal is still not a standardized product, whereas some of its competitors, as for example soymeal, have been reasonably well standardized. Because of this, some fish meal may not show up too well in computer and feed formulations. It was suggested and generally agreed upon that a team should be set up to coordinate work that is being done on computer formulating and to examine available information obtained from various laboratories throughout the world in order to ascertain what additional data might be needed regarding composition of fish meal and other ingredients going into formulations.

There was a strong feeling that quality of product will be an even more essential factor in fish meal sales in the not-too-distant future, which indicates that consideration may soon have to be given to the development of quality standards for fish meal. However, since it is necessary to have a reliable means

for determining and expressing quality, and this is done in many instances by chemical analysis, various analytical methods must be screened for accuracy as applied to fish meal, and suitable ones must then be agreed upon for use as standard methods of analysis.

In a discussion in the Subcommittee on analytical methods for use with fish meal, it was brought out that the first phase of such a project, which dealt with obtaining information regarding the various methods of analyses used in member countries, has been almost completed. The next step would be to make a study of the methods that appeared to be the most acceptable and then to conduct cooperative laboratory tests to determine the reliability of the methods for particular needs. It was mentioned that the Torry Research Station in Scotland could conduct studies on pepsin digestibility, fat content, and free fatty acids in the fat. A suitable method for the determination of the oil content of fish meal is of considerable concern to the group, and much discussion took place on this subject. It was brought out that several methods for oil determination are under study at Torry. One of these, a continuous extraction with hot chloroform-methanol mixture, appears to be superior to the A.O.A.C. acetone method and might not require acid hydrolysis of the meal as is needed in the latter method. However, crude extracts obtained with chloroform-methanol solvent contain much non-lipid material and therefore must be purified. This has been done by re-extraction with ethyl ether or saponification with alkali. It was stressed that rapidity and simplicity of determinations must be kept in mind in selecting routine analytical methods. Pepsin digestibility, lysine availability, and fat determination methods, and possibly total protein evaluations, were suggested for initial studies. It was brought out that in order to be able to compare results obtained by various investigators, standard or reference samples of fish meal should be made available for use in conducting the studies. It was agreed that the Scientific Subcommittee was to consider further the matter of analytical methods for fish meal and make recommendations based on its findings.

In discussions about odor suppression in connection with fish meal manufacture, nothing particularly new was brought out on the subject. Mention was made of the use of scrubbers and afterburners (incinerators) for removing many of the vapors, gases, and

International (Contd.):

such odors as those coming from burnt protein. It was brought out that some portions or fractions of the odors are removed by certain specific solvents.

Mention was made of the United Kingdom Association's Work Engineers Conference in which plant engineers and other closely associated with actual plant operation get together and discuss various production problems that they encounter. It was felt that much helpful information can be exchanged in this manner. The Subcommittee would like to encourage more of this type of thing being done and has suggested that, in the absence of meetings, correspondence could be used for the exchange of ideas and for discussing problems.

Quite a lot of time was given in the Main Session of the conference to discussions about fish flour. Tentative specifications for various types of the product, distributed at the meeting, were essentially the same as those discussed at the FAO nutrition conference in Washington. An FAO spokesman stated that the specifications might be considered more in the nature of guidelines to aid the authorities in the various countries in having standardized products with which to work. FAO is now in a position to accept samples of fish flour from lots that might be used in large-scale tests. Feeding projects have been recommended for the following countries: Chile, Peru, Morocco, Senegal, Ghana, and Pakistan. About \$300,000 will be needed to carry out these large-scale tests. The spokesman intimated that the industry should make some contribution to the cost of carrying out the project, either financially or by supplying sizable quantities of fish flour. About 300 tons of suitable quality fish flour will be needed for the tests over a 3-year period. South Africa could supply 8 to 10 tons the first year; it was thought also that Chile and Peru could be depended upon to supply some of the product. It was stated that the fish flour might cost about 15 cents a pound or slightly more, and, in discussion, it developed that FAO would not object to such a price.

It is evident that the Scientific Subcommittee of the Association is well aware of the need for the industry to produce high-quality fish meal and the need of the buyer to have some assurance that he is receiving

the high-quality meal that he expects. Much of the present work of the committee is aimed at seeing that these needs are realized.

Note: See Commercial Fisheries Review, December 1961 p. 59.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

MEETING ON SANITARY REGULATIONS AFFECTING FISH TRADE:

The Meeting of Experts on Sanitary Regulations Affecting Trade in Fish and Fish Products was held in Paris, December 11-14, 1961. The study and meeting were originally sponsored by the Organization for European Economic Cooperation (OEEC), and later after its establishment, by the Organization for Economic Cooperation and Development (OECD).

Objectives of the meeting were: (1) Examination of Draft Report on Sanitary Regulations Affecting International Trade in Fish and Fish Products, and completion of report in light of discussions at meeting, prior to publication. (2) Analysis of the scientific, technical and/or economic factors which have determined the establishment of sanitary regulations for fish and fish products presently in force in Member countries. (3) On basis of the Draft Report and papers presented by guest speakers and discussions, to recommend practical measures which might be taken toward simplification and harmonizing of national regulations in order to facilitate international trade.

Member countries were invited to nominate 3 or 4 participants who were responsible for, or interested in, sanitary, commercial, and other regulations affecting international trade in fish and fish products. It was suggested they should include: (1) Government officials concerned with sanitary and health regulations for fish and fish products. (2) Fish inspectors and/or veterinary officers responsible for sanitary control of fish and fish products. (3) Representatives concerned with the production and trade in fish and fish products. (4) Research personnel concerned with the testing and evaluation of fish and fish products from the sanitary point of view.

Forty persons attended the meeting from 15 OECD countries, together with OECD Fisheries Committee staff members, and the Norwegian consultant who prepared the Draft Report.

All participants were experts in some field of fisheries. For the most part, they were

International (Contd.):

representatives of their national inspection services. From some countries, these representatives were veterinarians, in others, the inspection staff had gained its experience in the fishing industry. Fishery research scientists, mostly bacteriologists, and four industry participants, who represented processors and exporters, completed the group.

The Draft Report was reviewed and the Working Documents (one for each subject listed) were read by their authors at general sessions. There was then a brief clarifying discussion period, after which the meeting divided into English- and French-speaking groups for detailed discussions of the working documents. These were followed by a general session which discussed the summarized comments of the two groups as presented by their respective chairmen. Chairmen were appointed from among the delegates for the general sessions and the group discussions.

On the Draft Report, the discussions brought out that international cooperation could be improved greatly. There needs to be agreement on such items as (1) scientific facts, (2) uniform methods of study, (3) standard terminology, (4) uniform certificates, and (5) how needed work shall be done.

The discussions covered the following subjects:

1. Difficulties encountered in international trade in fresh and deep-frozen fish due to application of sanitary regulations. The speaker pointed out three problems hindering international trade in frozen fishery products: (1) unrealistic information required on import certificates, (2) high inspection fees, and (3) the lack of tolerance on labeled weight figures. During the discussion these difficulties were acknowledged but it was brought out that a number of countries did not charge for inspection, and that most enforcement agencies did operate with an unrevealed tolerance on labeled weights.

2. Difficulties encountered in international trade in canned fish and other fish products due to application of sanitary measures. The speaker asked for uniform and coordinated regulations for canned fishery products with regard to the use of additives, labels, and cans, semipreserved products, and in-

spection and sampling, giving numerous examples of difficulties encountered. His request that preservatives not be declared on the label, or that it read only "Approved preservative added," met complete opposition from the veterinarians who contended that some consumers were allergic to some preservatives and must know what had been added.

3. Sanitary regulations for fresh fish: In outlining the possibilities of harmonizing regulations for fresh fish, the speaker and the discussion emphasized the protection needed to be afforded the consumer as contrasted with the previous speakers who were concerned mainly with trade obstacles. Inspection at sea was not considered feasible and must remain a responsibility of the fishermen. Otherwise, inspection must extend from the docks to the retailer. Exchange of inspectors between countries was deemed well worthwhile.

4. Sanitary regulations for deep-frozen fish: There was considerable discussion of the technical points in this paper. Two conclusions reached were that a bacteriological test of frozen products probably was not necessary except for breaded products, and there should be some simple means of determining whether frozen products had thawed and re-frozen in distribution channels.

5. Sanitary regulations for canned fish and semipreserved fish.

6. Sanitary regulations for salted fish.

7. Sanitary regulations for smoked and dried fish.

8. Sanitary regulations for shellfish.

9. Uniform methods of inspection and analysis of fish and fish products in international trade and uniformity of terminology.

10. International cooperation of fish inspection services and problems of training fish inspectors.

In summary, the meeting concluded that:

1. The basic draft report provided a very comprehensive view of the problems.

2. International trade in fishery products met with great difficulties because of wide

International (Contd.):

differences in national regulations on additives, labeling, etc.

3. Sanitary and quality control regulations were so closely related they must be studied together.

4. International regulations are premature until diverse regulations of exporting and importing countries have been studied and reconciled.

5. The importance of fresh fish as a raw material for all processed products was realized but harmonization of sanitary regulations for frozen, canned and semipreserved fish was deemed an immediate need. Similar action for salted, smoked, and dried fish and shellfish should follow.

6. There should be recommendations that: (a) Investigation of the problems of harmonization be conducted at national and international levels in collaboration with all interested governmental agencies, specialized research institutes, and the fishing industry. (b) Codes of basic scientific requirements and methods of control be prepared by expert groups established by OECD. (c) Duplicate work be avoided by cooperation with FAO, WHO, the International Institute of Refrigeration, the Permanent International Canned Food Committee, the European Council for Codex Alimentarius, the International Council for the Exploration of the Sea, etc. (d) Expert groups be set up for: I - Canned Fish and Semipreserves, II - Deep-Frozen Fish, III - Fresh Fish and Crustaceans, IV - Molluscs, and V - Salted, Smoked, Dried, and Other Fish. (e) OECD stimulate cooperation by assisting in exchange of pertinent information on sanitary regulations, inspection, control methods, etc. (f) OECD consider organizing a meeting of national inspection service officers to discuss the recommendations of the expert groups and their application, and closer cooperation between national inspection services.

The report of the meeting was scheduled to be presented to the OECD Fisheries Committee for review and recommendations at its next meeting, in late February or early March 1962. (Regional Fisheries Attache, United States Embassy, Copenhagen, report of January 4, 1962.)

EUROPEAN FREE TRADE ASSOCIATION

ANOTHER TEN PERCENT TARIFF CUT ANNOUNCED:

On March 1, 1962, five members of the European Free Trade Association (EFTA)--Denmark, Portugal, Sweden, Switzerland, and the United Kingdom--will cut their intra-EFTA tariffs by another 10 percent. Austria and Norway will follow suit not later than September 1. Under the Stockholm Convention (EFTA's "constitution"), this cut was not due until July 1, 1963.

The first EFTA tariff cut, one of 20 percent, was made on July 1, 1960, less than two months after EFTA came into being. The next cut, one of 10 percent was scheduled for January 1, 1962, but was actually carried out on July 1, 1961.

The advantages of the March 1 cut will be extended by the seven full members of EFTA to Finland, an associate member, on the same terms and conditions as they will be applying this decision among themselves.

In principle, the reductions are calculated on the basis of the tariffs actually in force and levied against imports on January 1, 1960. For Denmark, the basis for any product is the tariff applied to imports from other member states on March 1, 1960.

On March 2, the day after the tariff cut is effected, the Ministerial Council of EFTA will meet in Geneva. (EFTA Reporter, February 21, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 57.

LATIN AMERICAN FREE TRADE ASSOCIATION

TARIFF NEGOTIATIONS CONCLUDED:

The tariff negotiations between the seven original countries--Argentina, Brazil, Chile, Mexico, Paraguay, Peru, and Uruguay--of the Latin American Free Trade Association (LAFTA) have been concluded following almost 3 months of negotiations in Montevideo.

The tariff reductions listed in each of the national schedules of concessions forming part of the Act of Negotiations became effective in the respective negotiating country on January 1, 1962.

The combined concession lists comprise a total of over 2,450 items, many of which,

International (Contd.):

however, appear in the schedules of two or more countries. The number of individual concessions, including subitems, granted by each of the negotiating countries, expressed in terms of the Brussels tariff nomenclature, were as follows: Argentina, 413; Brazil, 623; Chile, 343; Mexico, 283; Paraguay, 232; Peru, 143; and Uruguay, 419.

The concessions granted apply mainly to natural products and raw materials generally traded between the countries, such as live animals, cereals, fats and oils, mineral products, hides and skins, fibers, and the like. Concessions also were granted, however, on many industrial products, such as textile manufactures, iron and steel products, machinery, electrical apparatus, and vehicles.

The concessions consist of reductions in duty of at least 8 percent below the rates applicable to imports from non-LAFTA countries and are expressed in terms of the rates to be collected rather than as percentage reductions from the general rates. These reduced rates do not apply to imports from the United States or other countries not members of LAFTA.

Colombia and Ecuador also joined the LAFTA, but too late to participate in the tariff negotiations just concluded. Separate negotiations with Colombia are scheduled to begin at an early date and those with Ecuador somewhat later.

Only single copies of the individual country schedules, in Spanish, have been received thus far by the American Republics Division, Bureau of International Programs, U. S. Department of Commerce, Washington 25, D.C., and are available for consultation. Information regarding the concession rates of duty granted by any of the signatory countries on specified products may be obtained from that agency.

The Latin American Free Trade Association was established by the Treaty of Montevideo, signed on February 18, 1960, and ratified on May 2, 1961. The tariff negotiations ended December 11, 1961.

WHALING

JOINT CANADIAN-JAPANESE ENTERPRISE TO OPERATE ON CANADA'S WEST COAST:

The Japanese Fisheries Agency was expected to authorize a large Japanese fishing

company to establish a joint whaling company in Canada to carry out whaling off the west coast of Canada, according to the February 8, 1962, issue of the Japanese periodical Suisan Tsushin. Two catcher boats were expected to sail for Canada in mid-March.

The Canadian side will invest US\$800,000 and the Japanese firm \$600,000 in the joint company to be established on Vancouver Island. The Japanese firm is said to intend using the base on Canada's west coast not only for whaling but also for trading in tuna, salmon, and other products.



Australia

TUNA FISHERY TRENDS AND SURVEY:

Continuing storms on the New South Wales south coast hampered tuna fishing from mid-November to mid-December 1961. The catch was approximately 530 tons during that period. On December 18, the total for the season was 1,583 tons.

The Captain of the Australian tuna survey vessel Estelle Star, which was then at Albany, was in Perth during the last week of November 1961 investigating the installation of long-line equipment in the vessel. It is hoped that experimental long-lining will be carried out in 1962.

Estelle Star, last season's top tuna vessel, has been investigating tuna possibilities off south-west Australia since August 1961, but as of early 1962 there have been no positive commercial indications. The survey is being conducted by the Fisheries Division, Australian Department of Primary Industry.

Late in November 1962, at Albany, the crew of the Estelle Star took live bait. The vessel worked back to Fremantle where she arrived on December 6. En route two southern bluefin tuna were trolled and tagged. (Australian Fisheries Newsletter, January 1962.)



Canada

FISHERIES PATROL OF EAST COAST WATERS:

As a precautionary measure against the encroachment of foreign fishing vessels on

Canada (Contd.):

east coast Canadian waters, patrols are being carried out by Canadian surface craft and aircraft, the Canadian Fisheries Minister announced on February 12, 1962.

The area concerned is the southwest coastal region of Newfoundland from Cape Anguille to Grand Bruit, but the range can be expanded if considered necessary.

The Fisheries Department's Newfoundland-based vessel *Arctica* is in the area and is being joined by the Department's vessel *Cygnus* out of Halifax. Reconnaissance missions are being carried out by naval maritime patrol aircraft.

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NEW BRUNSWICK FISH MEAL PRICES, JANUARY 1962:

Fish-meal prices (60-percent protein) quoted by New Brunswick producers the latter part of January 1962 averaged about C\$120 a short ton (\$2.00 a protein unit) for both exports and domestic sales. The price has remained the same since late July 1961. But in January dealers reported that supplies were very limited. (United States Consulate, Saint John, N. B., Canada, January 30, 1962.)

* * * * *

FISHERY LANDINGS, 1960-61:

Canadian sea fisheries landings (including Newfoundland) during 1961 totaled 1,856.8 million pounds (valued at C\$96.8 million) as compared with 1,679.7 million pounds (valued at C\$89.6 million) during 1960--an increase of 10.5 percent in quantity and 8.0 percent in value, according to the December



Fig. 1 - East coast Canadian fishermen in port repair their trawl lines. This type of gear used for cod and other groundfish caught by dory fishermen.



Fig. 2 - A method of drying salted cod still used in Newfoundland, Canada.

Canadian Landings and Ex-Vessel Values of Principal Species of Fish, 1960-61

Species	Landings		Value	
	1961	1960	1961	1960
	(In 1,000 Lbs.)		(In 1,000 C\$)	
Atlantic Coast:				
Cod	517,905	604,620	15,434	16,537
Haddock	118,772	95,127	4,645	3,685
Pollock	49,634	57,605	1,066	1,262
Herring	209,009	246,329	3,035	3,683
Lobsters	47,752	51,516	17,925	18,031
Pacific Coast:				
Halibut	1/28,560	2/33,869	1/6,008	2/5,399
Herring	447,234	187,675	4,577	3,153
Salmon	118,179	75,153	24,841	18,411

1/Including 4,372,000 pounds (C\$889,000) landed in U. S.

2/Including 6,707,000 pounds (C\$1,020,000) landed in U. S.



Fig. 3 - With a power-operated brailer, sardines are transferred to the hold of a carrier vessel where they are held in brine for three hours. Sardines are fished off the east coast of Canada.

Canada (Contd.):

1961 Monthly Review of Canadian Fisheries Statistics.

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COLD-STORAGE HOLDINGS**AND FREEZINGS OF****SELECTED FISHERY PRODUCTS:**

Stocks in Canada of frozen salt- and fresh-water fish and shellfish (not including smoked

fish and fish held for bait and animal feed) amounted to 35.2 million pounds on January 31, 1962, compared with 43.0 million pounds on January 31, 1961.

Freezings of salt- and fresh-water fish and shellfish amounted to 218.3 million pounds during 1961 as compared with 198.9 million pounds in 1960--an increase of 9.7 percent.

* * * * *

CANADIAN FIRM ASSIGNED SOLE RIGHTS TO BUILD NORWEGIAN-TYPE STERN TRAWLER:

A shipyard in Molde, Norway, has concluded arrangements with a Canadian firm in New Brunswick regarding the rights to build the new stern trawler-type constructed by that shipyard. The Canadian firm has the sole rights for building the stern trawler in Canada. The Norwegian shipyard's drafting office as of early this year was in full operation preparing the drawings for the Canadian firm. (Fiskaren, Norwegian periodical, January 17, 1962. News item translated by Regional Fisheries Attache, United States Embassy, Copenhagen.)

**Chile****FISH MEAL INDUSTRY EXPANDING:**

The concessions and privileges authorized under Chile's Fisheries Law (DFL No. 266 of April 1960 and Decree No. 133 of February 9, 1961), augmented by the 20-30 percent subsidies granted industry in the two northern provinces, have brought a sharp increase in the expansion of the fish meal industry in the Arica-Iquique area.

New capital investments programmed for new plants, expansion of present plants, and additions to the fishing fleet are estimated at Ch/E^o15 million to Ch/E^o17 million (US\$15.8 million to \$17.9 million). Of this sum Corporacion de Fomento de la Produccion de Chile (CORFO) will provide about Ch/E^o 13 million (\$13.7 million) in loans to private companies and in the development of its own enterprise, Empresa Pesquera de Tarapaca S.A. CORFO has obtained a loan of up to US\$5 million from the Inter-American Development Bank to finance the purchase of plant machinery and boats. Foreign private capital includes United States, South African, Swiss, and Norwegian investors.

Table 1 - Canadian Holdings of Selected Fishery Products

Products	January 31	
	1962	1961
	... (In 1,000 Lbs.) ...	
Blocks and slabs:		
Cod	3,268	3,653
Haddock	1,129	1,548
Flounders and sole	386	861
Unclassified	925	568
Fillets and steaks 1/:		
Cod	2,059	2,669
Haddock	1,600	1,457
Ocean perch	1,199	1,367
Flounders and sole	2,857	3,629
Halibut (not incl. fletches)	200	1,037
Salmon	108	66
Unclassified	145	96
Portions, all species:		
Cooked breaded	200	94
Raw breaded & unbreaded	126	283
Halibut, dressed	4,019	4,657
Salmon, dressed	3,573	5,508
Lobster meat	270	427
Scallops:		
Unbreaded	449	263
Breaded raw or cooked	160	69
All fresh-water fish:		
Dressed or round	3,682	4,340
Fillets	4,395	3,109

1/Does not include cooked or uncooked breaded products.

Table 2 - Canadian Freezings of Selected Fishery Products

Products	January-December	
	1961	1960
	... (In 1,000 Lbs.) ...	
Blocks and slabs:		
Cod	47,911	47,803
Haddock	11,213	7,999
Flounders and sole	2,805	49
Unclassified	6,246	3,166
Fillets and steaks 1/:		
Cod	24,525	19,048
Haddock	15,893	13,380
Ocean perch	12,331	12,506
Flounders and sole	19,806	22,982
Halibut (not incl. fletches)	1,568	2,885
Salmon	474	459
Unclassified	2,058	1,004
Portions, all species:		
Cooked breaded	1,446	100
Raw breaded & unbreaded	1,550	100
Halibut, dressed	18,532	14,515
Salmon, dressed	11,982	14,377
Lobster meat	1,921	2,771
Scallops:		
Unbreaded	5,814	5,515
Breaded raw or cooked	2,692	362
All fresh-water fish:		
Dressed or round	5,813	2,306
Fillets	5,454	5,076

1/Does not include cooked or uncooked breaded products.

Chile (Contd.):

The fishing fleet is increasing not only in number but also in size of vessels which will result in a substantial increase in its fishing power. It is anticipated that the landings of the Iquique fleet will be around 800,000 metric tons of anchovies in 1963. The entire fish meal production (approximately 160,000 tons) will be for export.

The continental shelf is narrow off northern Chile and the purse seiners work close to shore. There is real concern on the part of some technicians in the absence of scientific studies of the possible extermination of the anchovy which is the commercial fish of the northern zone. (United States Embassy, Santiago, report of February 1, 1962.)



Colombia

FISHING VESSEL LICENSING PROCEDURE:

The Division of Fishing of the Ministry of Agriculture of Colombia reported that licenses to fish for shrimp in Colombia are limited to 100 on the Pacific Coast and 60 on the Atlantic Coast. According to the Chief of that Division, about 80 licensed operators were fishing shrimp on the Pacific Coast as of mid-February 1962 with prospects very slim for additional licenses to be granted for that region due to an excessive supply of shrimp on hand in local storage centers. According to this same official, no operators were holding licenses for shrimp fishing on the Atlantic Coast.

In addition to this bleak picture for a new shrimp operator is the Colombian Government requirement that each boat owner establish onshore facilities for processing or storage of his catch, or alternatively, affiliate himself with an existing shrimp operator who maintains such required facilities. (February 20, 1962, report from the United States Embassy, Bogota.)



Congo Republic

FISHING INDUSTRY TRENDS, 1961:

SAPAC (La Société de Pêche d'Armement et de Conservation), the only fish cannery (tuna and pilchards) in the Congo, undertook

new investments in 1961 to increase considerably the capacity of its canning factory and to double the capacity of its storage facilities. Production was expected to rise by about one-third in 1961 to a monthly average of between 450,000 and 500,000 cans of tuna and pilchards (as compared with a monthly average output of 375,000 cans in 1960). By the end of the third quarter 1961, however, output was running much higher, at about double the 1960 rate. The pack is sold almost exclusively in the Equatorial Customs Union.

A United States west coast canning firm with large operations in Ghana, indicated serious interest in setting up a fish processing and fish freezing plant at Pointe-Noire if suitable investment incentives and other concessions were granted by the Congolese Government. Little progress had been achieved on this proposal by the end of 1961 although independent studies indicate that long-term investment opportunities in a fish processing and freezing industry in the Congo are good.

No statistical data are available on salt- or fresh-water fishing operations in the Congo. Most of Congo's fishing is done by pirogues operating from the beaches and in the rivers. Some fish supplies are also sold in Pointe-Noire by trawlers operating out of other countries. SAPAC also has a small fishing fleet of its own.

Aside from the above developments, and despite the introduction in June 1961 of an Investment Code setting forth certain rights privileges, and guarantees for investors, there appeared to be little interest, internally or externally, in undertaking private investments in new plants or in the expansion of existing fishery facilities. (United States Embassy, Brazzaville, report of February 22, 1962.)



Denmark

FISH FILLETS AND BLOCKS AND FISHERY BYPRODUCTS EXPORTS:

January-November 1961: Denmark exported 1.7 million pounds (41.0 percent) more fresh and frozen fish fillets during November 1961 than in the same month of 1960. Only 206,000 pounds, mostly cod and related species, were shipped to the United States in November 1961.

From January through November 1961, Denmark shipped 10.2 million pounds of frozen fish fillets and blocks to the United States, again mostly cod and related species.

Denmark (Contd.):



Fresh cod packed ready for freezing. Denmark's 1961 cod catch set a new record of 64,000 metric tons. Caught mainly in the Eastern Baltic and North Seas, more than half the catch is filleted.

Almost 19.4 million pounds (41.8 percent) more fresh and frozen fillets and blocks were exported by Denmark in January-November 1961 than in the same period of 1960.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Byproducts, January-November 1961 ^{1/}

Product	November		Jan.-Nov.	
	1961	1960	1961	1960
Edible Products:	..... (1,000 Lbs.)			
Fillets and blocks:				
Cod and related species	1,250	1,006	28,536	23,105
Flounder and sole	2,126	2,936	24,515	21,643
Herring	2,512	-	11,713	-
Other	51	2/270	1,081	2/1,680
Total	5,939	4,212	65,845	46,428
Industrial Products:	..... (Short Tons)			
Fish meal, solubles, & similar products	2,712	3,480	47,793	37,906

^{1/}Shipments from the Faroe Islands and Greenland direct to foreign countries not included.
^{2/}Includes herring fillets.

There was a drop of 768 short tons in Denmark's exports of fish meal, fish solubles, and other similar products in

November 1961 as compared with the same month of 1960. But exports of those products for the first 11 months of 1961 were 26.1 percent greater than for the same period in 1960.

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January-October 1961: Denmark exported 644,000 pounds (22.3 percent) more fresh and frozen fish fillets during October 1961 than in the same month of 1960. Only 431,000 pounds, mostly cod and related species, were shipped to the United States in October 1961.

From January through October 1961, Denmark shipped 10.0 million pounds of frozen fish fillets and blocks to the United States, again mostly cod and related species.

Almost 17.7 million pounds (41.9 percent) more fresh and frozen fillets and blocks were exported by Denmark in January-October 1961 than in the same period of 1960.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Byproducts, January-October 1961 ^{1/}

Product	October		Jan.-Oct.	
	1961	1960	1961	1960
Edible Products:	..... (1,000 Lbs.)			
Fillets and blocks:				
Cod and related species	1,406	1,503	27,286	22,099
Flounder and sole	2,781	3,447	22,389	18,707
Herring	1,619	-	9,201	-
Other	103	2/315	1,030	2/1,410
Total	5,909	5,265	59,906	42,216
Industrial Products:	..... (Short Tons)			
Fish meal, solubles, & similar products	5,590	4,911	45,081	34,426

^{1/}Shipments from the Faroe Islands and Greenland direct to foreign countries not included.
^{2/}Includes herring fillets.

There was an increase of 679 short tons in Denmark's exports of fish meal, fish solubles, and other similar products in October 1961 as compared with the same month of 1960. Exports of those products for the first ten months of 1961 were 31.0 percent greater than for the same period in 1960.

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AUCTION OF GREENLAND SEAL SKINS:

The Danish Royal Greenland Trade Department announced an auction of Greenland seal skins in Copenhagen, on March 7, 1962. About 21,160 Greenland ringed seals, 179 bladders of seals, 2,636 harp seals, and 17 saddle seals were to be offered for auction. (United States Embassy, Copenhagen, report of February 9, 1962.)



Finland

GOVERNMENT'S EFFORTS TO MODERNIZE FISHING FLEET:

The Fisheries Section of Finland's Board of Agriculture (part of Ministry of Agriculture

Finland (Contd.):

for some time has been concerned about the practice followed by Finnish fishermen of purchasing used trawlers which have been discarded by the Swedish fishing industry as a result of the latter's modernization program. In an effort to halt this practice, the Board of Agriculture has requested Finland's domestic shipbuilding industry for bids on steel fishing vessels costing Fmk 18 to 27 million (US\$55,900-83,900).

According to the plans of the Ministry, the fishing vessels would be purchased by private fishermen and would be largely financed by the commercial banks which would lend up to 75 percent of the value of the vessel at the going rate of interest. The Government in turn would pay a subsidy which would lower the effective interest rate to 3 percent, using for this purpose a Fmk 15 million (\$46,600) appropriation in the 1962 budget.

After the shipbuilders submit their proposals, the Board of Agriculture will inform fishermen of the availability of bank loans for the purchase of the trawlers. (United States Embassy, Helsinki, report of February 9, 1962.)



German Federal Republic

FISH OIL MARKET AS OF FEBRUARY 1962:

According to the leading fish oil importer, as of early February 1962, sales of fish oil in West Germany continued slow. Small quantities of U. S. menhaden oil were purchased by the margarine industry at a price of about US\$112 per metric ton (5.1 U. S. cents a pound),

c.i.f. Rotterdam, which is \$2 per ton (9/10 of a cent) less than the price paid in early January 1962. Peruvian oil was offered at \$115 a ton (5.2 cents a pound), c.i.f. Rotterdam, but no business was transacted on that basis. Some Peruvian oil was sold locally at about \$112 a ton. The importer believed that by March 1962 the Peruvians would reduce their prices. Reportedly, most buyers do not want to pay more than \$110 a ton (5.0 cents a pound) for Peruvian oil.

Margarine manufacturers apparently have ample stocks of fish oil to carry their production through May-July 1962. The depressed status of the fish oil market appears to be partly attributable to the prospect of the appearance of significant quantities of whale oil on the market in the next few months. The largest British user of fish oil is reportedly setting a price of £50-52 (US\$140-145.60) per long ton (6.4-6.6 cents a pound) for whale oil.

German fish oil production was at its seasonally low level in February. Export sales of German oil are sluggish in view of increased competition from Icelandic and Norwegian oils, but the low level of exports has not yet diverted German oil to the domestic market and thus render imported oils significant competition. (United States Consulate, Bremen, report of February 9, 1962.)

FISH MEAL PRICES,
FEBRUARY 2, 1962:

Prices reported at Hamburg Commodity Exchange as of February 2, 1962, for fish meal delivered ex-Hamburg warehouse, or c. & f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/metric Ton 1/	US\$/Short Ton
Danish herring	70-75	Loco	785.00	178.04
South African	65-70	Apr.-Oct. 1962	615.00	139.48
German	50-55	Feb. 1962	627.50	142.32
"	55-60	Feb. 1962	637.50	144.58
"	60-65	Feb. 1962	650.00	147.42
Peruvian	65-70	Feb. 1962	720.00	163.29
"	65-70	Mar. 1962	675.00	153.09
"	65-70	May-Dec. 1962	605.00	137.21
Angola	65-70	Mar. 1962	672.50	152.52
Icelandic herring	70-75	Feb.-Mar. 1962	755.00	171.23
" cod	65-70	Feb.-Apr. 1962	757.50	171.80

1/ Values converted at rate of 4.0 deutsche marks equal US\$1.

Note: "Loco" means where and as it is at the time of sales, and all subsequent expenses to be at buyer's account.

German Federal Republic (Contd.):

From January 5 to February 2 prices at the Hamburg Exchange showed a mixed trend. Prices for Peruvian fish meal firmed up and were substantially higher early in February than a month earlier. On the other hand, prices for German and Angola meal dropped during that same period. (United States Consulate, Bremen, report of February 9, 1962.)

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SWEDISH HERRING LANDINGS IN GERMANY:

Representatives for Swedish west coast fishermen recently met with representatives for the fish industry in Bremen for negotiations regarding the Swedish herring landings in Germany. It was pointed out from the German side that less than 10 percent of the Swedish herring landings in Germany in 1961 were made in Bremerhaven, and the question was raised whether it was possible for Swedish fishermen to increase the number of landings in Bremerhaven.

The Swedish group has also negotiated with West German representatives in Hamburg regarding the minimum price for herring landed in Germany. The West German canning industry has previously considered the present minimum price of DM13.60 per box containing 40 kilos (3.8 U. S. cents a pound) of herring too high. This price was accepted by the canneries and will remain in effect until July 1, 1962.

The Swedish West Coast Fishermen's group claims that Swedish fishermen in 1961 made 538 direct landings of herring in Germany, of which 22 were made in Kiel, 50 in Bremerhaven, 72 in Hamburg, and 394 in Cuxhaven. The quantity landed exceeded 20,000 metric tons, valued at 12 million Swedish crowns (US\$2.3 million).

The Swedish organization will try to increase the landings in Bremerhaven, but the spokesman said the location of the port, the facilities available to fishermen and the price received are the deciding factors for the landings. As of early February, Swedish fishermen received DM25.00 per box containing 40 kilos (7.1 cents a pound) of herring in some West German ports.

The Swedish herring landings in West Germany from January 1, 1962, were subject to

a 6 percent customs duty which remained in effect until February 15, 1962. From that date and until June 15, 1962, there is a duty-free period for herring imports. By that time, Swedish west coast fishermen hope that the duty-free quantity that previously has been promised, has been established. (United States Embassy, Goteborg, report of February 13, 1962.)



Ghana

JAPANESE MAKING TUNA SEINES:

A major Japanese net manufacturer is hanging tuna seines for four new Ghanaian fishing vessels purchased from British shipyards. Each net will weigh about 12 tons, will cost about \$55,000, and will be 450 fathoms long by 7 strips deep. The nets will be completely hung, dipped, and assembled in Japan and shipped to Ghana ready to use.



Iceland

FISHERY TRENDS, 1961:

Fishery Landings: The Icelandic fishing industry, which provides over 90 percent of commodity exports, enjoyed an exceptionally good year in 1961. The estimated catch for 1961 amounted to 631,000 metric tons as compared with 514,000 metric tons for 1960, an increase of 22.8 percent. The success of the fishing sector is based on the excellent herring catches. While the 1961 catch of white fish (314,000 metric tons) declined 16 percent, compared with 1960 (374,000 metric tons), the 1961 herring catch (317,000 metric tons) increased by 133 percent compared with 1960 (136,000 metric tons).

By the end of November 1961 the value of exports of herring products for 1961 was 560,427,000 kronur (US\$13.0 million), an increase of 43 percent in constant value over the comparable period in 1960. Of that amount, cured herring accounted for 259,434,000 kronur (\$6.0 million); herring oil, 106,324,000 kronur (\$2.5 million); herring meal, 136,061,000 kronur (\$3.2 million); and frozen herring, 58,608,000 kronur (\$1.3 million). For the south coast winter season, Iceland had foreign salted herring sales contracts for 120,000 barrels with the following countries: Soviet Union, 80,000; Poland, 20,000; and West Germany, 20,000 barrels. With the exception of the Soviet Union, most of the contracts had been filled by the end of 1961.

During December 1961, herring producers were experiencing difficulty in finding buyers for frozen herring. Out of a total 11,000 metric tons of frozen herring on hand at the end of 1961, only 6,000 tons have been sold—3,250 tons to West Germany and 2,500 tons to Poland. Negotiations to sell 5,000 tons to the Soviet Union were suspended. It is understood that Rumania is willing to buy 1,000 tons; likewise East Germany and Czechoslovakia. However, Iceland is probably reluctant to add to its large surplus of nonconvertible claims against the latter three countries.

Fish Oil: It is estimated that Iceland produced 48,500 metric tons of fish oil in 1961, compared to 34,100 metric

Iceland (Contd.):



tons in 1960, an increase of 43.5 percent. Fish oil exports are estimated at 36,500 metric tons for 1961 as compared with 52,900 metric tons for 1960. Iceland had a considerable supply of fish oil at the end of 1959. A severe drop in the price of fish oil, especially herring oil, caused by low prices offered in Western Europe by Peru, coupled with decreased exports of fish oil, reduced Iceland's foreign exchange fish oil earnings from 293,000,000 kronur (\$6.8 million) in 1960 to approximately 230,000,000 kronur (\$5.3 million) in 1961.

Trawler Difficulties: The prosperity of the fishing sector was not shared by the trawlers. The total trawler catch for 1961 was only 70,000 metric tons or about two-thirds the 1960 catch. The 1960 catch was 40,000 metric tons less than the one in 1959. In four years the trawler catch has dropped from 50 percent to 12 percent of the total fish catch. The Icelandic Minister for Fisheries claimed that extension of the fishing limits has cost each trawler about 600 metric tons in catch, a loss of 1.2 million kronur (\$27,840). It is presently being considered whether or not to allow the trawlers unrestricted entry within the 12-mile fishing limit. If such a ruling is made, the conservation argument which Iceland used to exclude trawlers of other nations will cease to be valid. Another possibility which has been considered is to compensate the trawlers from the Fisheries Fund. The motorboat owners have strongly opposed this solution, however.

Investment and Credit: Credit extended to the fisheries sector for the last half of 1961 continued to be about one-

third of the total bank credit. Investment in fishing returned to the normal 10 percent of total investment after the upsurge to 23 percent in 1960 caused by extraordinary investment in fishing vessels. At present there is also ample capacity for fish processing so that no large increase in investment in the fisheries sector is anticipated for the near future.

Developments in Selling and Pricing: The Althing (Parliament) has established a Fisheries Price Board which is empowered to set the price for white fish and herring for one year (more likely for one season) in advance. If this board is unable to reach a decision, the matter is sent to a board of arbitration. The Government has allowed a new company to sell frozen fish, an activity which for years had been the exclusive domain of the Freezing Plants Corporation and the Icelandic Federation of Cooperatives.

The fish pricing committee organized under the Althing's new regulations finally announced on January 29, 1962, the price to be paid vessels for cod and haddock landed during the main fishing season in 1962. This is 2.96 kronur per kilo (3.1 U.S. cents a pound), 0.25 kronur (26 cents a hundred weight) more than the average price paid in 1961.

The price increase of 9 percent was acclaimed by the Independence Party press as ensuring labor peace during the fishing season.

Frozen Fish Exports: In 1961 the United States replaced the Soviet Union as the principal buyer of Icelandic frozen fish. The United States imported 16,000 metric tons of Ice-

Iceland (Contd.):

landic frozen fish as compared with 3,250 metric tons imported by the Soviet Union. In 1960 the Soviet Union imported 24,000 metric tons and the United States imported 12,000 metric tons of frozen fish. Smaller landings of ocean perch, which normally go to the Soviet Union, and the increased capacity of the Icelandic-owned freezing plant in Maryland partially explain the shift in the pattern of Icelandic frozen fish exports.

The European Common Market: The Independence Party (the leading Government Party) resolved at its convention in October 1961 that Iceland must enter the Common Market (EEC) through some form of limited association. This attitude is shared in varying degrees by the Government opposition, the Progressive Party. The Icelandic Minister for Commerce said that Common Market outer tariffs against Iceland will eventually triple, therefore Iceland cannot afford to remain outside the EEC.

On January 1, 1962, the duty on frozen fish to Germany (at present Iceland's largest customer within the EEC) increased from 5 percent to 9.3 percent; iced fish, from 0 to 5 percent and will eventually rise to 15 percent. The duty on frozen fish to Holland increased from 0 to 6 percent and the duty on salted fish to Italy, which increased from 0 to 4.3 percent, will eventually become 13 percent. As other countries, which are customers as well as Iceland's competitors, enter the EEC, Iceland's competitive position will further deteriorate. On the other hand, it is felt that unrestricted entry of labor and capital, which full membership in the EEC implies, would be intolerable for Iceland, a country with only 177,000 people. (United States Embassy, Reykjavik, reports of February 1 and 6, 1962.)

Note: Values converted at 43.06 kronur equals US\$1.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-OCTOBER 1961:

How Utilized	1961	1960
	... (Metric Tons) ...	
Herring/ for:		
Oil and meal	184,447	91,088
Freezing	12,199	3,692
Salting	56,164	17,277
Fresh on ice	4,119	872
Canning	114	-
Groundfish/ for:		
Fresh on ice landed abroad . . .	24,625	20,282
Freezing and filleting	133,360	185,066
Salting	65,700	70,994
Stockfish	44,581	53,375
Home consumption	7,017	7,266
Oil and meal	3,414	6,173
Shellfish for:		
Freezing: Lobster	1,489	1,855
Shrimp	810	-
Canning (shrimp)	243	-
Total production	538,282	457,940
1/Whole fish.		
2/Drawn fish.		



Indonesia

JAPANESE-INDONESIAN FISHERIES AGREEMENT:

According to a report from Osaka, Japan, an agreement on an Indonesian-Japanese fisheries cooperation project is in the offing.

The Wakayama prefectural fisheries cooperative which has long been negotiating with the Indonesian authorities, expected to start building operation bases in Indonesia in April to put the project afoot.

The agreement, to remain in effect for 20 years, has been negotiated for nearly four years between the countries concerned.

It would reportedly obligate the Japanese side to: (1) build two operation bases, probably at Djakarta and Tjirebon, refrigeration warehouses, a cannery, a radio station, and medical facilities; (2) construct 25 fishing vessels and turn them over to Indonesia; and (3) send 113 fishing experts and technicians, including physicians and radio operators.

These obligations would constitute a credit to Indonesia. Repayment to the Wakayama prefectural cooperative would be in the form of a percentage of the realized value of the fish caught.

As of December 1960, when a preliminary agreement was signed between the Wakayama group and the Indonesian Department of Veterans' Affairs, the value of the credit to be extended was US\$2 million. (United States Embassy, Djakarta, report of February 8, 1962.)



Israel

FIRST TRAWLER-FREEZER VESSEL EXCEEDS EXPECTATIONS:

The former Norwegian factoryship Havkvern I, after its sale to Israel, was equipped with deep-freezing equipment which would maintain a temperature of -48 degrees C. (-54.4° F.) for 12-14 metric tons of fish per 24 hours. The storage space measures 450 cubic meters. Its name was changed to Azgad. The equipment was designed by Norwegian and Japanese experts for trawling in northwest African waters.

On its maiden trip, the Azgad obtained a full load of frozen fish in 15 days and landed its catch in Haifa 10 days after leaving the fishing grounds.

In the 6 months the Azgad has been fishing in 1961 as Israel's first trawler and freezer vessel, it has exceeded expectations by 15-20 percent. Its owner has ordered a new

Israel (Contd.):

freezer-trawler to work with the Azgad. The company plans to extend its operations to the Red Sea and the Indian Ocean. (January 17, 1962, Fiskaren, Norwegian periodical. News item translated by Regional Fisheries Attache, United States Embassy, Copenhagen.)



Japan

PRICES FOR FROZEN ALBACORE TUNA:

The Japanese price of frozen albacore tuna for export to the United States was reported higher in late January 1962--from US\$340 a short ton f.o.b. Japan to \$350 a ton, according to a translation from the Japanese periodical Suisan Tsushin, February 8, 1962. However, Japanese tuna packers in the Shizuoka area early in February were reported to be buying ship-frozen albacore tuna for 130 yen a kilogram (\$328 a short ton) and, as a result, one United States packer is said to be offering to buy frozen albacore for \$360 a short ton. Yellowfin tuna was reported selling for \$340 short ton.

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PRODUCERS TO CONTINUE SEPARATE EXPORT QUOTAS TO UNITED STATES FOR FROZEN YELLOWFIN AND ALBACORE TUNA:

The Japanese Export Frozen Tuna Producers Association met on January 19 to draft 1962 regulations for frozen tuna exports to the United States. Included in the agenda was a discussion on whether a single combined frozen tuna export quota should be adopted for albacore and yellowfin exported directly from Japan proper, in the same manner that the Exporters Association is currently handling frozen tuna exports to the United States.

At this meeting, the Producers Association appointed two separate committees, one to draft quota regulations on transshipments and the other on quota regulations covering direct exports from Japan to the United States. These two committees met separately on January 23, and 24, and recommended that total exports of frozen tuna to the United States in 1962 be set at 100,000 short tons, of which 65,000 tons would consist of direct exports from Japan proper. The direct ex-

ports are to consist of 30,000 tons of albacore and 35,000 tons of yellowfin, and this means that the Producers Association apparently will continue to have separate export quotas for yellowfin and albacore, rather than one single combined export quota for those two species.

In connection with the reorganization of the Overseas Fisheries Company, which operates the joint Japanese-Malayan tuna canning firm at Penang, Malaya, a vigorous movement to establish Singapore and Penang as transshipment bases appears to be under way. Some quarters believe that transshipments of frozen tuna from the Indian Ocean and Pacific Ocean should also be authorized, like transshipments from the Atlantic Ocean. Should the Japanese Fisheries Agency grant approval, it appears that transshipments of catches from those two oceans will likely be regulated under the present export quota for tuna exported directly to the United States from Japan proper. This is considered only logical since at the present time tuna taken in the Indian and Pacific Oceans by Japanese vessels can only be landed in Japan (except for special cases, like Samoa and Espiritu Santo, New Hebrides) and those fish are then exported to the United States under the quota covering direct exports from Japan. (Suisan Tsushin, Japanese periodical, January 17, 20, and 25, 1962.)

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FROZEN TUNA EXPORT QUOTAS FOR 1962:

The Board of Directors of the Japan Export Frozen Tuna Producers Association held a meeting on February 21, 1962, to draft regulations governing 1962 quotas for frozen tuna and frozen swordfish to be exported to the United States, according to a translation of a news item in the Japanese periodical Suisan Tsushin of February 22, 1962. At the meeting, a special 5,000-ton adjustment quota for direct export from Japan proper was newly established. This quota is in addition to the 65,000-ton quota (albacore tuna, 30,000 short tons; yellowfin tuna, 35,000 short tons) for direct export to the United States from Japan proper. Allocation of the 5,000-ton quota will be discussed at the next directors' meeting. The 1962 export quotas adopted at the meeting are:

1. Frozen tuna exports from Japan proper:

- a. Frozen albacore tuna quota, 30,000 short tons. Of this, 26,000 tons are to be allocated on the basis of past performance; 3,900 tons unassigned (so-called free quota); and 100 tons reserved.
- b. Frozen yellowfin tuna quota, 35,000 short tons. Of this, 28,000 tons are to be allocated on the basis of past performance; 6,900 tons unassigned (free quota); and 100 tons reserved (above allocations include yellowfin loins).
- c. Tuna loin quota, 5,000 short tons. Of this, 4,000 tons are to be allocated on the basis of past performance;

Japan (Contd.):

935 tons unassigned (free quota); 15 tons reserved; and 50 tons for adjustment purposes.

d. Special adjustment quota, 5,000 short tons.

2. Transshipments: An aggregate total of 120 trips will be permitted for fishing vessels delivering their catches for transshipment to the United States. Number of trips each fishing vessel can make will depend on its cargo-carrying capacity, like in 1961.^{1/}

3. Swordfish export quota, 6,500 short tons. Of this, 5,500 tons are to be allocated on the basis of past performance; 975 tons unassigned (free quota); and 25 tons reserved.

^{1/}According to Suisan Tsushin, March 9, 1961, fishing vessels with cargo capacities of less than 150 tons shall be limited to 5 trips (with special permission from the Association's Board of Directors, up to 8 trips); 150 to 250-ton capacity fishing vessels shall be restricted to 4 trips each; 250 to 550-ton capacity vessels 3 trips each; and vessels with over 550-ton capacity 2 trips each.

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FROZEN TUNA LOINS EXPORT QUOTA RAISED:

At a loins committee meeting of the Japanese Export Frozen Tuna Manufacturers Association held in February 1962, it was agreed that the export shipment quota to the United States of tuna loins for the new year should be fixed at 5,000 short tons instead of the original planned quota of 4,800 tons. At the meeting some committee members proposed that the present ratio of the 5-percent "free quota" should be raised by a wide margin. (Translated from a Japanese periodical, February 14, 1962.)

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ATLANTIC OCEAN TUNA FISHING CONDITIONS:

A total of 67 Japanese tuna long-line fishing vessels were reported operating in the Atlantic Ocean early in February 1962. This was an increase in the Atlantic tuna fleet of 4 vessels over January, when the fleet totaled 63 vessels. In October 1961, there were 49 Japanese vessels operating in the Atlantic Ocean; in November 53 vessels; in December 62 vessels. The rapid increase in fleet strength is the result of the Japanese vessels concentrating on the albacore tuna fishing grounds in the central and western half of the Atlantic Ocean off the Brazilian coast between 3° S. to 15° S. latitude. In early January 1962 tuna vessels in the 500-ton class were reported to be catching an average of 7-8 metric tons of albacore per day. After mid-January, the catch leveled off to about 5-6 tons per day.

Albacore catches drastically declined in February and vessels of the 500-ton class were catching an average of about 2 tons of albacore per day. As a result, the Japanese long-liners were leaving the albacore grounds and moving to the yellowfin grounds in the eastern Atlantic Ocean between 2° S. to 5° S. latitude. Early reports from those vessels which commenced yellowfin fishing indicated fishing was good, with vessels in the 500-ton class averaging 6 to 8 metric tons of yellowfin per day. The good catches of yellowfin contrast sharply to the low catches made in the spring of 1961. (Translated from the Japanese periodical Suisan Tsushin, February 6 and 8, 1962.)

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YAIZU FISHERY LANDINGS, JANUARY 1962:

Fishery landings at Yaizu (leading Japanese tuna fishing port) in January 1962 totaled 7,732 metric tons valued at 833 million yen (US\$2.3 million), an increase in value of 11.7 million yen (\$32,500) over January 1961. Approximately 70 percent of the landings consisted of tuna and tunalike species. On the basis of quantity, Indian bluefin led all other species with 1,800 tons, followed by 1,480 tons yellowfin, and 1,319 tons big-eyed. Landings of tuna and tunalike fish totaled about 600 metric tons less than in the same month last year. Ex-vessel prices were high,

Yaizu Fishery Landings, Principal Species, January 1962			
Species	Quantity		
	Metric Tons	1,000 Yen	US\$1,000
Indian bluefin . . .	1,751	179,336	498
Australian bluefin .	58	8,341	23
Big-eyed	1,319	152,278	423
Albacore	883	112,535	313
Yellowfin	1,477	186,318	517
Swordfish	52	7,405	20
Skipjack	40	3,083	9
Mackerel	680	29,186	82

averaging 119 yen per kilogram (\$300 per short ton). The total value of the landings was 647 million yen (\$1.8 million). January 1961 landings of tuna and tunalike fish averaged 102 yen per kilogram (\$257 per short ton). Translated from the Japanese periodical Suisan Keizai Shimbun, February 7, 1962.

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EX-VESSEL TUNA PRICES:

The following prices were bid on February 23, 1962, for tuna landed by the Japanese

Japan (Contd.):

Type	Price	
	Yen/Kg.	\$/Short Ton
Yellowfin (round):		
Large (over 100 pounds)	114	287
Medium (80-100 pounds)	123.8	312
Small (20-80 pounds)	123.8	312
Albacore	134.8	340
Filets:		
Yellowfin	124.4	314
Big-eyed	108-110.6	272-279

tuna vessel No. 8 Asama Maru, which caught a total of 250 tons of tuna and tunalike fish, including a small quantity of shark, according to a translation from the Japanese periodical Suisan Keizai Shimbun of February 24, 1962.

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SEEKS RELAXATION OF UNITED STATES CANNED TUNA IMPORT RESTRICTIONS:

Japanese Minister of Agriculture and Forestry Kono planned in late February 1962 to submit a request to U.S. Secretary of the Interior Udall calling for the relaxation of United States canned tuna import restrictions, according to the Japanese periodical Nippon Suisan Shimbun, February 2, 1962. The Japanese Minister reportedly wants to increase Japan's tuna exports to the United States and promote the development of the Japanese tuna fishing industry.

Japanese tuna exports to the United States consist mainly of canned tuna in brine and frozen tuna. Annually, the equivalent of 135,000 short tons of tuna, consisting of 95,000 tons of frozen tuna and the remainder canned tuna in brine, are exported to the United States. Japanese tuna exports to the United States generally have increased in spite of various complications that have hampered this trade, but the periodical points out that this does not warrant optimism since there are continual movements in the United States to restrict Japanese tuna imports.

The United States restricts imports of canned tuna in brine by means of a tariff quota. Imports of canned tuna in brine in any existing year not exceeding 20 percent of the total United States canned tuna pack during the preceding calendar year are dutiable at 12.5 percent ad valorem. Imports exceeding 20 percent of the U.S. canned pack are dutiable at 25 percent ad valorem. Minister Kono reportedly intends to concentrate his efforts on seeking relaxation of this tariff quota system.

As for frozen tuna, the United States does not apply any trade restrictions on this product and Japan voluntarily regulates its frozen tuna exports to the United States. Japanese Minister Kono is reported to have discussed frozen tuna exports with Secretary Udall during the U.S.-Japan Economic Council meeting held in November 1961 in Tokyo. Reportedly, both Minister Kono and Secretary Udall shared each other's views concerning promotion of Japanese frozen tuna exports to the United States. Japan plans to bring this matter up for discussion once again at the forthcoming meeting of the U.S.-Japan Economic Council in May 1962. Details concerning the manner in which Japan will submit its proposal to the United States apparently have not yet been worked out, but the Japanese Fisheries Agency stated that this matter will likely be brought up for detailed study at the coming U.S.-Japan meeting in May, along with the subject of promoting Japan's frozen tuna exports to the United States.

The Japanese periodical Suisan Tsushin, February 12, reported that Minister Kono delivered a note to Secretary Udall requesting that the United States relax tuna import restrictions. This note is stated to have touched on present

United States tariff restrictions on imports of canned tuna in oil and in brine and expressed the hope that the increase in tuna consumption in the United States will promote the development of both the Japanese and United States tuna industry, and indicated Japan's desire to seek a harmonious export trade relationship with the United States.

Japan is expected to bring this matter up once again at the U.S.-Japan Economic Council meeting scheduled to be held in May. However, inasmuch as the United States tuna import tariffs were negotiated under the General Agreement on Tariffs and Trade (GATT), it is expected that this matter will be formally negotiated by the GATT at the request of Japan.

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THIRD SALE OF CANNED TUNA IN BRINE FOR EXPORT TO U. S.:

Following a meeting on February 8, 1962, the Japan Canned Foods Exporters Association announced that 100,000 cases of canned white meat tuna in brine and 80,000 cases of canned light meat tuna in brine for export to the United States were to be offered at the third canned tuna sale, deliveries to be com-

Japanese Sales of Canned Tuna in Brine for U. S. Market, 1962				
Type	Third Sale	Second Sale	First Sale	Total
	.....(No. Cases).....			
White meat tuna	100,000	130,000	130,000	360,000
Light meat tuna	80,000	130,000	100,000	310,000
Total	180,000	260,000	230,000	670,000

pleted by April 15. Export prices are the same as for the first two sales--\$9.95 per case (No. $\frac{1}{2}$, 7-oz., 48's) f.o.b. Japan for white meat tuna and \$7.70 per case (No. $\frac{1}{2}$, 7-oz., 48's) f.o.b. Japan for light meat tuna. (Suisan Shimbun Sokuho, February 9, 1962.)

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FISHING COMPANIES PLEDGE NOT TO PACK TUNA CANNED IN BRINE FOR EXPORT AT OVERSEAS BASES:

The Japanese Fisheries Agency early this year requested all fishing companies to submit a memorandum to the Agency promising that they "will not engage in the manufacture and export of canned tuna packed in brine" at their overseas bases. The Japanese fishing firm, which plans to establish a fishing base at Curacao with facilities for processing fish sausages but not canned tuna, submitted a memorandum to this effect, but attached the condition that its promise becomes void in the event that the Fisheries Agency permits Japanese overseas companies, other than the joint Japanese-Malayan cannery and base located at Penang, Malaya, to engage in the manufacture and export of canned tuna in brine. (Suisan Tsushin, February 17, 1962.)

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Japan (Contd.):

EXPORTS OF CANNED TUNA IN OIL, 1961:

Data compiled by the Japanese Canned Tuna Producers Association show that a total of 1,406,127 cases of canned tuna in oil were approved for export in 1961. This was 40 percent more than 1960 exports, which totaled 1,002,280 cases. For the period April-December 1961 a total of 1,146,805 cases were approved for export, compared to 824,093 cases for the same period in 1960, and 1,136,863 cases in 1959--a new record. (Translated from the Japanese periodical Suisan Tsushin, February 10, 1962.)

Note: Total exports from Japan on a calendar or full fiscal-year basis are somewhat greater.

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EXPORTS OF TUNA SPECIALTY PACKS:

Data compiled by the Canned Tuna Producers Association show that Japanese exports of specialty canned tuna products (other than those packed in brine and oil) totaled 168,443 cases for the period April-December 1961. Exports to West Germany totaled 132,239 cases, the Netherlands 14,287 cases, Belgium 9,871 cases, Canada 6,532 cases, and England 2,000 cases. (Suisan Tsushin, February 12, 1962.)

Japanese Exports of Tuna Specialty Packs, April-December 1961

Product	April-December
	No. Actual Cases
Vegetable tuna	97,285
Jelly tuna	43,955
Seasoned tuna	21,100
Curry tuna	3,150
Tuna in tomato sauce	2,135
Others	818
Total	168,443

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FIRM TO CHANGE PRICE AND PACK SIZE OF ITS CANNED TUNA SPECIALTY PRODUCTS:

The Japanese fishing company which is packing canned curried tuna, sandwich tuna, and vegetable tuna, plans to change the pack size and price of those canned tuna specialty products. The firm began to market those products in June 1961. Currently, those products are packed in Japanese No. 3 cans, 48 cans per case and retail for 65 yen (US\$0.18) per can. Comments regarding their quality and flavor have been good, but the firm feels that the products have not gained consumer acceptance because of their

retail price and plans to lower the price and to pack the products in Japanese No. 2 cans, 48 can per case, instead.

The production target for 1962 (April 1962-March 1963) has been set at 150,000 cases of No. 2 cans. In 1961, the Japanese firm sold about 80,000 cases of No. 3 canned curried tuna, sandwich tuna, and vegetable tuna. This was far below sales expectations. (Suisan Tsushin, February 13, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 72.

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FROZEN SWORDFISH EXPORTS TO UNITED STATES INCREASED:

The Japan Frozen Foods Exporters Association decided to increase the frozen broad-bill swordfish quota for export to the United States by 1,000 short tons, according to a translation of a news item in the Japanese periodical Suisan Tsushin of February 10, 1962. As a result, the quota became 6,500 tons. Of the additional 1,000 tons, 544 tons will be allocated on the same basis as for the fixed base quota and 446 tons of the remaining 456 tons will be allocated through a method to be decided by the committee in the future.

Japanese exports of frozen swordfish totaled 5,126 tons April 1, 1961, through January 31, 1962, applicable to the export quota.

Note: See Commercial Fisheries Review, January 1962 p. 54.

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FISHING COMPANY TO ESTABLISH WHALING AND CRAB FISHING BASE IN ARGENTINA:

A large Japanese fishing company's trawler Taiyo Maru (500 gross tons) was surveying the waters off the island of Tierra del Fuego situated near the southern tip of Argentina, according to the Japanese periodical Suisan Tsushin of February 6, 1962. Should this survey prove favorable, the Japanese firm will proceed with its plans to establish a whaling and crab fishing base on Tierra del Fuego. Plans call for starting construction of shore facilities in March, and for base operations to commence in the fall.

The Taiyo Maru, which began exploring the waters south of Argentina in November 1961, expected to continue its survey until March. This vessel was to be joined by two

Japan (Contd.):

of the Japanese firm's whalers, the Seki Maru No. 12 and the Fumi Maru No. 12, operating out of Brazil. They will investigate whale resources in Argentine waters.

Pending outcome of the surveys, the Japanese firm plans to invest approximately 100 million yen (US\$278,000) for the construction of processing facilities on Tierra del Fuego Island. Two whalers would be assigned to the island base to catch 600 sei and sperm whales per year, the frozen whale meat to be exported to Europe. In addition, the Japanese firm hopes to pack at this base the equivalent of 20,000 cases of crabs, which would be frozen for export to the United States.

ANOTHER TRAWLER TO FISH IN WEST AFRICAN WATERS:

In January 1962, a new 1,500-ton stern trawler entered the Japanese distant-water trawl fishery to operate in West African waters. A sistership is scheduled for completion in May 1962. Hitherto, the company operating these vessels has not been engaged in the West African trawl fisheries. (Suisan Keizai Shimbun, Japanese fishery periodical, January 13, 1962.)

TRAWLERS EXTEND OPERATIONS TO SOUTH AFRICA:

Since late 1961, the Japanese company operating trawlers in the vicinity of the Canary Islands, off Northwestern Africa, had expanded its operations to South Africa. By early 1962 this company expected to have 4 vessels, ranging in size from 750 to 1,500 gross tons, trawling off the coast of Cape Town. One of the vessels had been operating in New Zealand waters.

Large quantities of sea bream were being taken off South Africa, and as of mid-January the company had shipped about 3,500 metric tons to Japan by commercial freighter. (Translated from the Japanese periodical Shin Suisan Shimbun Sokuho, January 17, 1962.)

PLANS TO INVESTIGATE EAST AFRICAN FISHERIES CHANGED:

The Japanese Overseas Fisheries Cooperative Association has temporarily cancel-

led plans to investigate the fisheries of Kenya, Uganda, Tanganyika, and Zanzibar. The four African nations requested the postponement until they have established a "customs union" or similar economic arrangement. Instead, the Japanese survey team will go to Saudi Arabia and Lebanon.

The activities of the Overseas Association are financed by the Ministry of International Trade and Industry (MITI). That government agency contributes about 75 percent of the Association's annual budget. (Source: Various Japanese periodicals.)

INVESTMENT POSSIBILITIES IN WEST AFRICA STUDIED:

The Japanese Ministry of International Trade (MITI) will finance a study of investment possibilities in the fisheries of the West African coast during the fiscal year April 1, 1962, to March 31, 1963. This is the fourth major overseas survey sponsored by MITI since the 1959 study of Pakistan. The study will be conducted by the Japanese Overseas Fisheries Cooperative Association. (Suisan Keizai Shimbun, January 11, 1962.)

GOVERNMENT PLANS SURVEY TO DEVELOP NEW FISHING GROUNDS:

The Japanese Fisheries Agency's budget for FY 1962 (April 1962-March 1963) includes funds for conducting exploratory studies in the southeastern Pacific Ocean area and in the Okhotsk Sea.

To study the distribution and migration of fish stocks in the southeastern Pacific Ocean, the Fisheries Agency plans to have its research vessel Shoyo Maru (603 gross tons) survey the area east of 100° W. longitude between 10° and 20° S. latitude off the coast of Callao, Peru, and the area east of 110° W. longitude in the vicinity of 30° S. latitude off the coast of Valparaiso, Chile.

For the Okhotsk Sea survey, the Fisheries Agency plans to charter a 400-ton class trawler to explore the waters off the western coast of the Kamchatka Peninsula, mainly off Icha, between May-July 1962. (Suisan Tsushin, Japanese periodical, January 17, 1962.)

Japan (Contd.):

CANNED SARDINE EXPORT
PRICES REDUCED:

The Japan Canned Sardine and Saury Sales Company in February 1962 announced a reduction on canned sardine export prices.

Japanese Export Prices of Canned Sardines Packed in Tomato Sauce				
Can and Case Size	New Price Per Case		Former Price Per Case	
	Yen	US\$	Yen	US\$
1-lb. oval, 24's	1,225	3.40	1,275	3.54
8-oz. oval, 48's	1,450	4.03	1,500	4.17
5-oz. tall, 100's	2,300	6.39	2,400	6.67
8-oz. oblong, 48's	1,475	4.10	1,525	4.24

At the same time, the Sales Company announced that it will raise the price of jack mackerel packed in tomato sauce, 8-oz. oval 48's, from 1,175 yen (US\$3.26) per case to 1,200 yen (US\$3.33). (Suisan Tsushin, February 22, 1962.)

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SARDINE INDUSTRY TRENDS AS OF
MID-FEBRUARY 1962:

Japanese sardine fishing centered around the Sendai Bay on the Sanriku coast. As of February 10, 1962, it was still going on and the fishing extended south to Onahama, Fukushima Prefecture, and north to Ohfunado, Iwate Prefecture, where many schools were seen close to shore and heavy landings were continuing at every fishing port.

Sardine packers at each location mentioned were reported to have packed some 200,000 cases up to February 10. The amount packed was being allocated half for export and half for domestic needs. (Suisan Tsushin, Japanese periodical, of February 10, 1962.)

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CANNED SARDINE EXPORT QUOTA, 1962:

The directors of the Japan Export Canned Sardine Producers Association met on February 15, 1962, to discuss the

Table 1 - Allocation of Japanese Canned Sardine Export Quota

Type	FY 1962 1/	FY 1961 2/
	.... (1,000 Cases)	
Allocation of export quota:		
Quota based on past performance	450	525
Unassigned quota	250	225
Quota for newly-authorized exporters	5	5
Reserve quota	300	250
Total export quota	1,005	1,005

1/April 1, 1962, to March 31, 1963.

2/April 1, 1961, to March 31, 1962.

method of allocating canned sardine export quotas for fiscal year 1962 (April 1962-March 1963), according to a translation from the Japanese periodical Suisan Tsushin of February 16, 1962. Quota allocation recommendations drafted at the meeting for submission to the Association's special general meeting on March 5 and 6 are shown in table 1.

Table 2 - Sales of Japanese Export Canned Sardines in FY 1961 (As of February 12, 1962)

Can and Case Size	Carry Over	Consignments	Sold	On Hand
	..... (In Cases)			
1-lb. oval, 48's	3,445	209,504	148,218	80,703
8-oz. oval, 48's	13,396	135,735	110,867	36,774
5-oz. tall, 100's	45	45,031	18,760	25,865
No. 4, 48's 1/	-	133	7	144
No. 1 tall, 48's	217	15,786	16,003	-
8-oz. oblong, 96's	-	3,240	3,215	-
ENT 2/	2,271	83	2,348	-
Total	19,374	409,533	299,418	143,486

1/Japanese can size--dimension: 214 x 406.

2/Code for Japanese can size. We are unable to decipher code.

As of February 12, 1962, over 400,000 cases of export canned sardine were consigned to the Japan Canned Sardine and Saury Sales Company. Consignments and sales of export canned sardine for FY 1961 (April 1, 1961-March 31, 1962) as of February 12 are shown in table 2.

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FACTORYSHIP FISH MEAL OPERATION
OFF ANGOLA SUCCESSFUL:

The Japanese fish meal factoryship Renshin Maru (14,094 gross tons), operating in the waters off Angola, Africa, finished fishing on February 12, 1962. The vessel was expected to arrive in Japan sometime near mid-March. The Director of the firm operating the factoryship returned to Japan from Angola on February 19, 1962. He stated that it was worthwhile diverting the fish meal factoryship to Angolan waters during the off-season in the Bering Sea bottom fishery, rather than keeping it tied up in port, and reported that his firm had concluded a 4-year contract with an Angolan company to produce fish meal. He stated that the fish meal produced by the Renshin Maru contained about 70 percent protein, with a high of 72 percent. Locally-produced fish meal is reported to contain an average of 65 percent protein. The firm's Director made the following comments on his Angola trip:

1. The Renshin Maru fulfilled its production targets for frozen fish and fish meal. Production of fish meal totaled 5,000 metric tons. Protein content of fish meal averaged 70 percent, attaining a high of 72 percent. Therefore, in quality, the Renshin Maru's fish meal is superior to that produced locally from sardine, which contains an average of 65 percent protein.

2. Sardine landings vary considerably. Therefore, in order to handle large landings, factoryships operating in Angolan waters must be equipped with plants having large holding capacities. Fish were purchased from about 40 Angolan fishing vessels at a price of 4,800 yen (US\$13.33) per metric ton. Some of the vessels were operating without any contract and were selling their catches to the Renshin Maru only because shore processing plants could not handle their catches.

3. The sea bottom off the Angolan coast is rocky with very little shell. Thus, large trawlers are not practical but smaller trawlers of about 20 tons may be utilized profitably in scattered areas. Fish suction pumps were used on the factoryship for the first time. Difficulties were en-

Japan (Contd.)

countered during the first few days of operation, but efficiency gradually improved to the point where 30 tons of fish could be suctioned in 20-30 minutes.

4. Agreement with the Angolan company was based on attainment of fixed production goals, and profits were to be adjusted when catches exceeded or fell below production targets. The Angolan company, which is not a fishing firm but deals in automobiles and loans, is emphasizing a technical association rather than the present system of sharing profits.

5. During Renshin Maru's operation in Angolan waters, rumors were heard about 3 Japanese fish meal factory-ship fleets and 4 trawlers being sent to Angolan waters. While the rumors proved groundless, Japanese firms must avoid excessive competition among themselves at this time when future prospects of the enterprise are difficult to foresee, particularly with respect to marketing. (Shin Suisan Shimbun Sokuho, February 22, 1962.)



Malaya Federation

MARKET FOR CANNED SARDINES AND MACKEREL:

Price consideration is an important factor in marketing canned sardines and mackerel in the Federation of Malaya. Imports from Japan are popular for price reasons, and quality is acceptable. In some selective markets, better quality is demanded with price not as great a factor. The more expensive types are imported from the United States (sardines, pilchards), Norway and Denmark (sardines, pilchards), and anchovies from Italy. Some stores reported they discontinued United States brands largely due to the price differential. It is believed that United States suppliers can make a good showing in the Malayan market, but they need to conduct or arrange for an importer to conduct some type of selling campaign, usually not attempted in Malaya. There is a product-quality minded market in Malaya as is proved every day in many lines by appropriate salesmanship.

Wholesale prices reported by the trade in Malaya also indicate the more typical types of packs preferred: horse mackerel from Japan in tomato sauce, 15-ounce can, 48 cans per case, M\$6.63 per dozen (US\$8.75 a case); pilchards from United States and Japan packed in tomato sauce, 15-ounce can, 48 cans per case, M\$26 to M\$28 (US\$8.58-9.24) per case; sardines from United States packed in tomato sauce, 15-ounce can, 48 cans per case, M\$36 per case (US\$11.88); Norwegian sar-

dines packed in oil, 3 $\frac{1}{4}$ -ounce can, 100 cans per case, M\$0.47 each (US\$15.51 a case); anchovies from Italy packed in olive oil, 2-ounce can, packed 100 cans per case, M\$9.60 per dozen (US\$12.67 a case).

The Malayan full import duty on canned mackerel, sardines, and anchovies is 25 percent ad valorem. But there is a preferential duty of 10 percent which applies only to imports from British Commonwealth countries eligible for preferential rates under the Imperial Preference System--this includes United Kingdom, Canada, Australia, New Zealand, India, and Pakistan. Commodity import controls have been relaxed for almost all imports, including fish items, and only an open general license is needed. Exchange licensing continues, but there is no exchange problem at present and licenses are freely granted. (United States Embassy, Kuala Lumpur, report of February 7, 1962.)

Note: Values converted at rate of M\$1 equals US\$0.33.



Mexico

SHRIMP FREEZING PLANT AT GUAYMAS PLANNED:

At the end of January 1962, the press reported that a Mexico City firm (owners of several fishery enterprises) plans to construct a large shrimp freezing plant, as well as an ice house and storage facilities in an area near the PEMEX storage depot at Guaymas, Sonora, on the Mexican west coast. Construction was expected to begin soon, with completion of the freezing plant scheduled for August this year. The cost of the plant will be an estimated 8 million pesos (US\$640,000).

At a later date, the same company is reportedly considering the installation of a plant for the manufacture of fish flour and the construction of a dock on the same site.

The source for this story which received fairly wide circulation was reported to be the Director General of the Mexican firm. This is the first venture of this firm into Sonora where several shrimp-freezing plants are already located. The firm owns a fishery enterprise in Topolobampo, Sinaloa, as well as others in Escuinapa, Mazatlan, and Culiacan, Sinaloa, and Salina Cruz, Oaxaca.

This is the first result of the Governor's drive to attract more industry into the State

Mexico (Contd.):

of Sonora which began late in 1961. Further investments are expected to be announced in the near future. (United States Consulate, Nogales, Sonora, February 14, 1962.)



Netherlands, West Indies

JAPANESE FISHING BASE AT CURACAO DELAYED:

A large Japanese fishing firm, which has been planning on establishing a fishing base complete with cold-storage and fish sausage processing facilities at Curacao Island, Netherlands Antilles (in the Caribbean Sea north of Venezuela), since the summer of 1961, is yet unable to proceed with the construction of the base, although it has already received approval from the Netherlands and Japanese Governments. This is reportedly due to the Japanese Finance Ministry's delay in approving the Japanese firm's application to float bonds to finance the venture.

Originally, the Japanese firm had planned to establish the Curacao Development Company, with an authorized capital of 404,880,000 yen (US\$1,125,000) and a capital investment of 101,220,000 yen (US\$281,000). The company was to operate the cold-storage facilities (one of 1,500-ton capacity and another of 100 tons) and sausage plant (daily output 50,000 pieces) at the base, as well as handle transportation arrangements. However, late last year, the Japanese firm decided to establish a subsidiary company, to be called the Curacao Transportation Company, with a capital investment of 4,000,000 yen (US\$11,100), to handle all transportation arrangements.

The Finance Ministry had originally planned to approve the Japanese firm's initial application by the end of last year. Reportedly, a Curacao bank had already authorized a loan of 101,220,000 yen (US\$281,000) for capital investment and was awaiting the Bank of Tokyo's guarantee. However, the Japanese firm's change in plan prompted the Finance Ministry to review the entire Curacao venture, thus delaying the processing of the Japanese firm's application. (Suisan Tsushin, February 17, 1962.)



Norway

BUYERS' STRIKE ANNOUNCED BY FISH PRODUCERS ASSOCIATION:

The Fish Producers Association, the latter part of February 1962, proclaimed a buyers' strike in North Norway, from East Finnmark to Helgeland, because of dissatisfaction with prices fixed by the Fishermen's Association. Except for Lofoten, no freezing plants were affected. (News of Norway, February 22, 1962.)

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FISHERIES TRENDS:

North Norway's Fish Price Dispute Settled: The North Norway fish price dispute was settled early in March 1962. In regard to the Lofoten area, a tripartite agreement called for an extraordinary state subsidy to reduce the price of cod in the period from February 28 to March 10, subject to approval by the Norwegian Parliament.

Whaling: Norway's 7 Antarctic whaling expeditions processed only 204,350 barrels of oil in the first 54 days of the 1962 season. This was 175,440 barrels less than 8 Norwegian expeditions processed in the first 53 days of last season. The 1962 season opened 16 days earlier than the previous season. The Norwegians this year are using one less factoryship and 10 less catching boats in their Antarctic whaling operations.

Norwegian whale catches have been considerably below the national quotas during the past two seasons.

Women Fishermen: Norway had 43 women commercial fishermen in 1960, reports the Central Bureau of Statistics. Five women gave fishing as their only occupation. (News of Norway, March 1, 1962.)

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COD FISHERY TRENDS, JANUARY 1-FEBRUARY 17, 1962:

The 1962 season's total landings of cod in Norway during January 1-February 17, 1962, amounted to 14,676 metric tons, compared with 19,865 tons for the same period last year.

Bad weather had hampered cod fishing to that date this season. Prospects for improved landings were good if the weather im-

Norway (Contd.):

proved. Of this year's landings, 2,320 tons were sold for drying, 4,669 tons for salting, 3,412 tons for sale fresh, and 4,275 tons for filleting. In 1961 in the same period 3,195 tons had been sold for filleting. This season's fishery also yielded 5,152 hectoliters (479 metric tons) of cod-liver oil and a quantity of cod roe. (Fiskets Gang, February 21, 1962.)

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NORWEGIANS CLAIM STERN TRAWLER BETTER THAN SIDE TRAWLER:

The Norwegian stern trawler (Hekktind of Melbu, Norway), during its last 7 months of fishing in 1961 landed about 1,200 metric tons of fish valued at 1.5 million Norwegian kroner (US\$210,000). Crew shares for the period amounted to about 18,700 kroner (\$2,618).

A preliminary review shows that the Hekktind's catch is about 20 percent greater than that of the side trawlers of the same company, according to its report to Lofotposten. (Translated from Fiskaren, Norwegian periodical, January 17, 1962, by Regional Fisheries Attache, United States Embassy, Copenhagen.)



Philippine Republic

WHOLESALE PRICES FOR CANNED SARDINES AND MACKEREL:

The most popular canned sardine product in the Philippines is that packed in tomato sauce. A survey of major Manila markets on January 27, 1962, shows that prices increased about 10 to 20 percent since the Philippine peso was freed on January 21, 1962.

Manila Wholesale Prices for Canned Sardines and Mackerel, January 27, 1962

Product	Pesos/case	US\$/case
Canned Sardines:		
Tomato sauce, 15-oz. ovals, 48 cans per case	31-33	10.33-11.00
Tomato sauce, 5-oz. cans, 100 cans per case	18.50	6.17
Spanish-style in olive oil, spiced, 5-oz. cans, 100 cans per case	48	16.00
Spanish-style in tomato sauce or olive oil, 5-oz. cans, 100 cans per case	38.50	12.83
Mackerel in natural oil, 8-oz. cans, 48 cans per case	18.50	6.17

Note: Converted at free rate of 3.00 Philippine pesos equal US\$1.

Sardines are the most popular canned fish product in the Philippines; they form an important part of the diet of low-income groups. There is a definite preference for United States brands of sardines, but the United States has lost much of the market, apparently because of problems of supply. While price is an important factor to the large numbers of low-income consumers of sardines, United States brands can still command some premium.

Executive Order No. 5, of January 21, 1962, which became effective 30 days later, amends section 16.04 of Republic Act 1937 by reducing the tariff on canned fish (with the exception of tuna) from 15 percent to 8 percent ad valorem.

On January 21, 1962, a free floating rate was established for the peso. There is a new requirement, however, that cash deposits be made returnable after 4 months, to accompany the establishment of letters of credit. Canned fish, considered an essential item by the Philippine Government, generally receives preferential treatment. For example, the opening of a letter of credit for the importation of canned fish requires a cash deposit of only 25 percent as compared with deposits of up to 150 percent for some luxury items. NAMARCO, a Government corporation, imports large quantities of sardines free of duty and taxes for distribution by selected Filipino retailers. (United States Embassy, Manila, February 13, 1962.)

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NEW IMPORT TARIFFS IMPOSED ON CANNED FISH:

According to information received by the Japan Canned Foods Exporters Association, the Philippine Government has established new import tariff rates for canned fishery products.

Philippine Islands 1962 Tariff Rates on Canned Fish Imports	
Canned Product	Tariff Rate
	% Ad Valorem
Mackerel	8
Salmon	8
Sardine	8
Anchovy	8
Tuna	15
Squid	20
Abalone & other fishery products	50 or 1 peso per kilogram 1/

In addition, the special import duty, previously imposed at the rate of 15 percent, was lowered to 6.8 percent. Sardine and salmon are exempt from the special import duty. Anchovy packed sardine style and mackerel packed salmon style are also expected to be exempt from the special duty. Bonds for imported canned fishery products must be posted within 120 days at the following rates: 25 percent for mackerel, salmon, sardine, and anchovy; 150 percent for tuna.

Philippine Islands Imports of Canned Fishery Products, 1961					
Origin	Sardine	Mackerel	Squid	Anchovy	Saury
	(Cases)				
United States	69,771	10,768	6,081	220	-
Japan	133,730	236,566	107,856	9,400	2,072
South Africa	2,239,782	128,452	-	-	-
Hong Kong	-	4,250	-	-	-
Europe	110,853	-	950	-	-
Total	2,554,136	2/380,036	114,887	9,620	2,072
1/The specific rate of 1 peso per kilogram at 2.75 pesos equal US\$1 amounts to 16.5 U. S. cents a pound.					
2/The total for imports of canned mackerel was 434,036, but the data by countries only adds to the total shown.					

Philippine Republic (Contd.):

squid, abalone, and other fishery products. Information on saury and jack mackerel is not available.

Reportedly, the National Marketing Corporation (NAMARCO) of the Philippine Government is negotiating with the Philippine Central Bank to apply the former official exchange rate of 2 pesos to 1 U.S. dollar for products currently imported by NAMARCO. As soon as a decision is made on this matter, NAMARCO is expected to announce its first offer to purchase canned sardine. (From the Japanese periodical *Suisan Tsushin*, February 10, 1962.)



Senegal

TUNA PROGRAM REORIENTED:

The Government of Senegal has reoriented the tuna program for the season November 1961 to May 1962, as a result of previous disappointing seasons. The catch goal for the 1960/61 season was 13,500 metric tons, of which 10,000 tons were to be canned for the French market and 3,500 tons for the United States and other foreign markets. Although the Senegalese tuna industry has a canning capacity of 30,000 tons a year, only about 8,000 tons were produced in the 1960/61 season when 56 "clippers" and 10 "freezers" from France fished for Senegal. This year France will send only 26 "clippers" and no "freezers." (The French "clippers" are small vessels of 15-ton capacity with no refrigeration.)

Senegal will not be able to fill the quota of canned tuna that France has agreed to buy; additional sources of fish are being sought. In 1962, the Government hopes to purchase five freezers as a nucleus for her own fishing fleet. A proposed government-private corporation under Senegal's Development Plan will attempt to raise the necessary funds with assistance from French and German sources.

In 1963 it is hoped that 10 additional freezers can be purchased. A new fishing pier, now under construction at Dakar with a loan of about US\$2 million from the European Economic Community, is scheduled for completion in 1963. By that time the canning industry will be reorganized with a single cannery to be constructed on the pier. It is also planned to assist some of the existing canneries to convert their operations to sardine canning, primarily to sell in African markets to the south. (United States Embassy, Dakar reports of February 13, March 24, May 29, and December 18, 1961.)



Sierra Leone

IMMIGRATION OF FOREIGN FISHERMEN PROHIBITED:

In recent years Sierra Leone fishermen have been demanding protection from competition by Ghana (Fanti) fishermen who have been settling permanently along the coast to fish in the waters off Sierra Leone.

Late in December 1961 the Sierra Leone Government published an order reading: "The immigration to Sierra Leone by land, sea, and air of any fisherman whatsoever who is a native foreigner is hereby prohibited." (The term native is interpreted to mean any national of an African country.) The Ministry of International Affairs, however, has authority to grant written permits for such immigration. (United States Embassy, Freetown, report of December 27, 1961.)



Somali Republic

JAPANESE INTERESTED IN SOMALI FISHERIES:

As a result of an exchange of trade delegations with the Somali Republic, the Japanese have expressed an interest in the fisheries potential of that country. In January 1962, a six-man Japanese delegation visited fishing centers in the province of Migiurtinia on the Gulf of Aden and the Indian Ocean. (United States Embassy, Mogadiscio, January 5 and 17, 1962.)



South Africa Republic

TUNA FISHING COMPANY ESTABLISHED:

South Africa's new tuna industry early this year reached another stage in its development with the formation of a R200,000 (US\$280,000) tuna corporation. The Cape company will carry on the work started by its three equal shareholder firms.

The South African move towards tuna fishing on a commercial scale has been a steady process, but as of early 1962 there have been no substantial landings or large exports.

The catch is still being exported frozen to overseas canneries.

South Africa Republic (Contd.):

Meanwhile, research is continuing into the resource in Cape waters, and the use of the Japanese long-line method, coupled with temperature and other observations by the Division of Sea Fisheries vessels, is revealing a clearer picture of the best tuna fishing areas off South Africa. (The South African Shipping News and Fishing Industry Review, January 1962.)

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NEW ORGANIZATION FORMED TO MARKET CANNED FISH:

Another South African canned fish marketing organization was created in December 1961 with the formation of Silversea Sales (Pty.) Ltd., a joint venture by two well-established firms at Saldanha Bay and two on the St. Helena Bay coast.

The new company will handle all local and export sales of the four firms. The marketing organization started operation in January 1962.

The four canneries involved are among the most modern and best-equipped on the Cape west coast and steps have been taken to apply strict quality control in the canneries, so that the new marketing organization will be in a position to offer "prime quality" products. (The South African Shipping News and Fishing Industry Review, January 1962.)



Spain

NEW COLD-STORAGE PLANT FOR BERMEO:

Early in 1962 a new cold-storage plant started to operate in the fishing port of Bermeo, Vizcaya, Spain. The plant has a storage capacity of 5,000 cubic meters capable of maintaining a temperature of -32 degrees F. and two freezing tunnels (with temperatures of -50 degrees F.) capable of handling 60 metric tons of fish in 24 hours. The purpose of the plant is to offer the fishermen of Bermeo the possibility of storing their catch if the terms of sale are unfavorable when the boats land.

The firm, which has storage facilities capable of maintaining a temperature of -42

degrees F. in Bilbao, Vigo, Malaga, and Zaragoza, reports that it has orders for three times its present capacity and that it is beginning to construct an expansion of the new plant to a capacity of 15,000 cubic meters.

The firm provides freezing and cold storage. It does not package and distribute the fish. (United States Consulate, Bilbao, report of February 7, 1962.)

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NEW FISH PACKING PLANT IN BILBAO:

A new fish processing and canning plant is being built in Santurce, Bilbao, Spain, by the Federacion de Cofradias de Pescadores de Bajura de Vizcaya, which represents the 4,200 coast fishermen of the province of Vizcaya. The purpose of the plant is to handle the anchovy, tuna, bonito, and mackerel species that are caught seasonally in nearby waters. The machinery for the plant has been contracted for locally. Construction of the plant started early in February 1962.

Since in the past fishermen have had to sell anchovies at very low prices, or even to throw them back into the sea, during the height of the season because there were insufficient preservation facilities, it is hoped that the plant will be finished in time to operate during the anchovy season which is scheduled to begin at the end of March. The plan is that the plant will initially be devoted to preparing anchovies in salt (in barrels and in tins) and fillets of anchovies in pure olive oil (in tins); an annual capacity of 1,000 metric tons of anchovies is planned.

When finished the plant will consist of a basement and two floors totaling 1,500 square meters. During the anchovy season the plant should work two shifts of 8 to 10 hours with a total work force of 200 women and 10 men. Profits will be distributed among the supporting fishermen's associations. (United States Consulate, Bilbao, report of February 2, 1962.)



Sweden

INTERNATIONAL FISHERIES FAIR HELD AT GÖTEBORG:

The first Swedish International Fisheries Fair was held in the Swedish Trade Fair's exhibition halls (Svenska Massan) November 2-12, 1961, at Göteborg.

Sweden (Contd.):

The increasing significance of the Swedish fishing industry and the large interest shown in fisheries in general at the exhibitions held in Copenhagen, Denmark, and Bergen, Norway, made it possible to realize the plans for the exhibition, which was the first of its kind in Sweden.

The consensus was that the scope of the fair was well planned. The arrangement of the exhibits made it an easy fair to survey.

The fair was open from 10 a.m. to 8 p.m. on weekdays and from 10 a.m. to 7 p.m. on Saturdays and Sundays.

The number of visitors during the 11 days the exhibition was open reached a total of 25,000 persons divided among 15 countries and was higher than expected by the management of the fair. Furthermore, over 50 percent of the visitors were buyers. Several study groups from foreign countries visited the fair.

The number of commercial exhibitors was limited to 200 presenting over 300 firms and organizations of which about 200 were Swedish and 100 were foreign. The following countries were represented at the fair: Belgium, Canada, Denmark, England, Finland, France, Holland, Iceland, Italy, Norway, Poland, Switzerland, and the United States.

The fisheries fair covered all fields of the fishing as well as other industries connected with fishing. An impressive section was found in the industry hall where engines of various types were on display; Diesel engines dominated this section. Engines with 500 horsepower were very much in evidence. They appear to be as common as engines of 100 horsepower about 15 years ago. The largest motor was a Diesel engine of 800 horsepower, built for a Swedish trawler. The cost of this motor is 250,000 Swedish crowns (US\$48,300).

A single-boat floating trawl was on display. This trawl differs from previous constructions inasmuch as the trawl boards continuously have contact with the bottom of the sea. It is reported that the trawl has been tested with good results by one Swedish west coast trawler and that additional trawlers from that area will commence fishing with

this type of trawl. On display were also various kinds of nets, ropes, steel wire, etc.

Exhibited were ice-making machines of various types (three American manufacturers were represented through their local representatives), fork trucks, fish-processing machines (such as skinning machines, filleting machines, and slicing machines), scales, packing machines, and conveyers.

The Swedish West Coast Fishermen's Central Association had an information exhibit about Swedish fishing where statistics showing quantity and value of landings in Sweden and abroad, exports, different types of fish caught, quantity of ice and number of fishboxes consumed, etc., were featured. The exhibit also presented data illustrating the financial loans available to fishermen in some European countries showing that fishermen in England may receive loans making up about 90 percent of the purchase price of a craft, followed by West Germany, Iceland, Denmark, Norway, Holland, and finally Sweden, where the Government loans only comprise between 10 and 20 percent of the purchase value.

Delegations from four countries--Great Britain, France, Poland, and West Germany--visited the fair.

A model of a Polish steel trawler was on display at the fair. The trawler was built by a ship repair yard in Gdynia, and is sold by the Polish export organization. The trawler has a length over-all of 24.6 meters (81 ft.); length between perpendiculars 21.85 meters (72 ft.); breadth moulded 6.57 meters (21 ft.); depth moulded 3.38 meters (11 ft.); draught moulded 2.64 meters (9 ft.); average speed 10 knots; engine output 225 hp.; fresh-water tank 5.6 tons; fuel oil tanks 13.0 tons; number of crew 10 persons.

Note: See Commercial Fisheries Review, June 1961 p. 81, April 1961 p. 84.



U. S. S. R.

OCEAN PERCH FISHING
IN THE BERING SEA:

Ocean perch fishing in the Bering Sea and the use of that species by the Russians was the subject of an article in the Russian periodical *Rybnoe Khoziaistvo* (December 1961). In part, this is what the article says:

U. S. S. R. (Contd.):

Russia's fish catch in the Far East has doubled in the past ten years. One of the new and most promising regions is the East and Central Bering Sea. The VNIRO and TINRO scientific expeditions, conducted from 1957 to 1959, played a large part in opening up this new fishing area. The distribution of the main commercial species and the areas of their greatest concentration were studied. After only three years of exploitation, already more than 100,000 metric tons of fish are taken annually in the East Bering Sea. Flounder, until recently, was the most commonly fished species in the Bering Sea. In 1960, the fleet began to catch ocean perch.

Ocean perch is marketed fresh, refrigerated, or frozen. But most of the catch must be frozen because the fish is caught far from consumption areas.

Frozen perch is suitable for fried fillets and boiled perch. From the head and bones a rich fish broth is obtained. Frozen perch can also be smoke-cured. The liver has a high vitamin A content. However prepared, perch is tasty and has a good fat content.

Taking perch in the Bering Sea is rather complicated, requiring catch methods completely different from those used for flounder. Ocean perch appears in small schools. The uneven rocky ocean floor in the area snags the nets, causing a great loss of time. A small concentration of vessels often loses a school. Clouds, bad visibility, strong currents, and lack of radio ships complicate the fishing. Despite all these difficulties, however, we have learned the proper trawling preparations and fishing techniques. In order not to lose the schools, many vessels go after one school. The captains of the trawlers radio each other the school's position and movements.

The 1961 plan or target was for approximately 50,000 tons of ocean perch. In 1962 the catch will increase several times.

Russia will continue to expand ocean perch, flounder, and other fish catches in the Bering Sea. In the future they plan to take no less than 500,000 tons of fish. The Bering Sea will no doubt become the main fishing region of the Far East.

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BERING SEA FISHERY CATCH, 1960-1961:

In 1961, the Soviets in the Bering Sea registered a spectacular advance with an estimated fishery catch of about 330,000 metric tons--a 122-percent increase over 1960 when about 138,000 tons were taken. Intensified fishing effort by the Soviets in the Bering Sea began in 1955 with the use of modern vessels, including factoryships, according to Rybnoe Khoziaistvo (No. 10, October 1961), a Russian periodical.

Table 1 - Soviet Bering Sea Fishery Catch, 1960-1961

Species	1961 ^{1/}	1960
	... (Metric Tons) ...	
Flatfish	173, 100	105, 680
Ocean perch	48, 500	11, 700
Saury	2/24, 440	13, 000
Herring	68, 700	-
Other fish	2/14, 701	7, 820
Total	2/329, 441	138, 200
^{1/} Estimated.		
^{2/} Forated estimate from 1960 figures.		

Table 2 - Soviet Fishery Products Produced from Bering Sea Catch

Product	1961	1960
Frozen fish	171, 000 tons	117, 600 tons
Salted fish	55, 000 "	50 "
Canned fish (saury) . .	1/	29, 200, 000 cans
^{1/} Not available.		

Bering Sea fishing is directed by the Main Administration of Far East Fisheries (Glavdal'vostokrybprom), with headquarters at Vladivostok and branch offices in the Maritime, Kamchatka, and Sakhalin regions.

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HERRING FLEET INCREASED:

On June 10, 1962, a larger Russian herring fleet is scheduled to leave Murmansk for Iceland in an attempt to increase significantly the herring catch, according to the February 14, 1962, issue of *Fiskaren*, a Norwegian fishery trade weekly. A recently completed report stated that the Russian trawler fleet filled its quota last year, but the herring catch was down. The fishery combine directorate in Murmansk, therefore, placed additional and more modern vessels in the herring fishery. Nets and seines with lighter and thinner twine are to be used. The Russians will depend this year, as earlier, on pair trawlers in the herring fishery, but in the fleet going to Iceland there will be more purse seiners.

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U. S. S. R. (Contd.):

U. S. S. R.-NORWAY NEGOTIATIONS ON FISHING RIGHTS:

On February 12, 1962, negotiations on Soviet fishing rights in Norwegian territorial waters were resumed in Moscow at the Soviet's request.

Preliminary talks were held in Oslo in late November 1961 when the U. S. S. R. asked permission to fish Norwegian waters between 6 and 12 nautical miles for a 10-year period. Norway's position was that the U. S. S. R. should grant reciprocal rights to Norwegian fishermen off the Soviet coasts. The Soviets have rigidly maintained that their coastal boundary of 12 miles is a territorial boundary while the Norwegian 12-mile limit zone is a fishing boundary. Moreover, the Soviet commitment to import Norwegian fishery products for several years was thought by the U. S. S. R. to be sufficient compensation to Norway for the fishing rights concession.

The Norwegian delegation has maintained that the reciprocal principle be applied allowing Norwegians to fish within the Soviet territorial boundary between 6 and 12 nautical miles. (News of Norway, November 30, 1961; unpublished sources.)

FACTORY TRAWLERS RETURN TO GEORGES BANK:

Early in February 1962, two large exploratory factory trawlers arrived on Georges Bank fishing grounds. Last year, Soviet fishing vessels were not sighted on those grounds until May.

Boston trawler captains returning from Georges Bank the week of February 18 reported sighting 10 Russian fishing vessels in that area.

NEW FACTORYSHIP JOINS PACIFIC FISHING FLEET:

The Evgenii Nikishin was launched at the Leningrad Admiralty Shipyards in January 1962. This is the second of a new series of factoryships equipped for canning; the first was the Andrei Zakharov (15,000 gross tons and an estimated length of 540 feet). Both factoryships are assigned to the Soviet Far

Eastern Fishing Fleet; the Andrei Zakharov fished for king crab in Bristol Bay during 1961. (Unpublished sources.)

PACIFIC SALMON CAUGHT OFF NORWAY:

Pink salmon (Oncorhynchus gorbusha) were being taken in 1961 along the Kola Peninsula and Northern Norway. These fish are the result of successful Russian transplants made in streams flowing into the Barents Sea. The eggs were obtained from the Russian Far East.

In 1956, Soviet scientists, who had been experimenting since the 1930's, transplanted 2.4 million fertilized eggs of pink and chum salmon (O. keta). After these proved insufficient for desired results, 13 million more eggs were transferred in 1957, 19 million in 1958, and 21.6 million in 1959. (The Fishing News, November 10, 1961.)

OCEANOGRAPHIC-FISHERY RESEARCH:

The U. S. S. R. conducts a vast program in which oceanographic studies play a major part in fishery research. The All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO) coordinates the work of thousands of Soviet scientists, technologists, and other workers engaged in marine research activities. The Soviet research program, by emphasizing exploration of new fishing areas and mechanization of fishing gear, has contributed to the expansion of U. S. S. R.'s high-seas fisheries.

Two major U. S. S. R. research institutes are (1) Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk, and (2) Pacific Research Institute of Marine Fisheries and Oceanography (TINRO), Vladivostok. Fisheries and oceanography are also studied by other regional institutes, branch research stations, laboratories, and universities.

In 1962, TINRO will conduct major fishery investigations in the western Pacific for the first time. Several vessels will be used to study fishing conditions for mackerel, ocean perch, and tuna. In the northern Pacific, a research team will study fish populations down to 400 fathoms. Other reconnaissance vessels of TINRO will operate in the Sea of Japan, Bering Sea, the Sea of Ok-

U. S. S. R. (Contd.):

hotsk, and the Indian Ocean. Currently, the trawler Baidar is engaged in studying the distribution and spawning habits of saury in the

Pacific Ocean. (Fisheries Year Book and Directory 1961, British-Continental Trade Press Ltd., London, England; unpublished sources.)



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Marine Resources Advisory Committee Approved by FAO Commission
(Correction in article in February 1962 issue p. 54)

Information received since this news item was published indicates that the last paragraph (1st complete paragraph in column 2) should be changed to read as follows:

"As approved by Commission II, the Advisory Committee would be composed of not more than 15 fisheries experts, selected after consultation with governments and intergovernmental and other bodies of FAO member countries concerned with fisheries research."

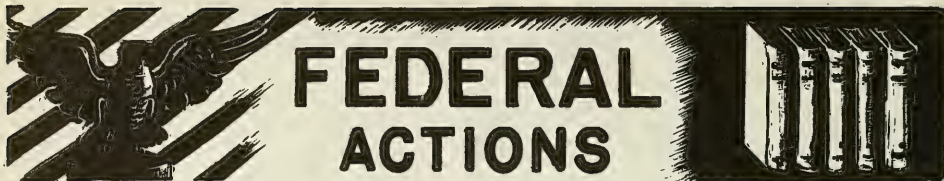
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RUBBER "PORPOISE SKIN" TO SPEED UP VESSELS

From his observations of the behavior of porpoises and the structure of their skins, a former German scientist, Dr. Max O. Kramer, has developed a new form of rubber coating for ships he claims will allow them to travel faster without any increase in power, or at the same speed with less power than is now required. Normally an object as it moves through the water consumes some 70 to 90 percent of its propulsive energy to overcome the drag due to turbulence created by itself. The application of the coating will, it is claimed, reduce turbulence by some 50 percent in completely submerged bodies.

The coating is in the form of a thin layer of rubber supported on the inside by millions of tiny rubber pillars. Between these pillars interconnecting channels contain a freely-flowing viscous liquid. The outside of the coating is smooth, but the channels give it flexibility and the liquid provides the necessary damping to suppress potential turbulence. A porpoise is similarly covered with a $\frac{1}{16}$ -inch (1.6-mm.) hydraulic skin which is elastic and ducted.

Experiments have already been carried out on the hulls of motorboats and there appears to be a considerable advantage in rubber coating of this type on the kind of craft that plane on the water. (Canadian Fisherman, vol. 48, 1961, no. 3, p. 36.)



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

REVISED FEES PROPOSED FOR FISHERY PRODUCTS INSPECTION SERVICES:

Higher fees for fishery products inspection services are proposed by the U.S. Department of the Interior. It is proposed to amend title 50 of the Code of Federal Regulations by amendment, addition, and deletion of sections that specifically apply to fees and charges for inspection services. The purpose of the proposed changes as published in the March 6, 1962, Federal Register is to achieve a higher degree of uniformity in the assessment of fees and the method of charging for services rendered. The change is necessary to offset the normal costs to the Bureau of Commercial Fisheries for rendering the inspection service.

This is the first official proposed change in the rate of inspection fees since the Bureau assumed responsibility for the conduct of the inspection service from the U.S. Department of Agriculture in July 1958. The proposed changes in the rates are a reflection of the increased operating costs to the Bureau in maintaining the program on a sound and self-supporting basis as required under the authority by which the program is conducted. All future proposed changes in rates necessitated by Federal pay acts and increased operating costs will be announced in the Federal Register.

For continuous inspections, the fee for regular time would be \$4.20 per hour; for overtime \$5.00 per hour. Also included is a schedule of lot inspection fees for officially and unofficially drawn samples.

Amendment is proposed of the following sections under Inspection Services: Sections 260.70 (Schedule of fees), 260.71 (inspection services performed on a resident basis), 260.72 (Fees for inspection service performed under cooperative agreement), 260.73 (Disposition of fees for inspections made under cooperative agreement), and 260.76 (Charges based on hourly rate not otherwise provided for in this part). Proposed is the addition of a new section--260.81 (Readjustment and increase in hourly rates of fees). It is proposed to delete section 260.75.

Interested persons could submit written comments, suggestions, or objections on the proposed changes before April 5, 1962.

PROCESSOR ACCOUNTABLE FOR REMOVAL OF USDI SHIELDS FROM MISLABELED FISHERY PRODUCTS PACKAGES:

The Department of the Interior proposed a change in its regulations for U.S. standards for grades of processed fishery products. The change would add a new provision to re-

quire accountability by the processor for the removal or stripping of official U.S. Department of the Interior (USDI) shields from packages of mislabeled fishery products. The proposal was published in the February 24, 1962, Federal Register.

U.S. standards for grades of many fishery products require that the final grading be conducted on the packaged frozen product. End product grading is performed by U.S. Department of the Interior inspectors when fishery products are produced under continuous inspection. When a processor elects to include an approved Federal shield or identification mark as part of the printed label, a calculated risk is taken that despite this labeling the product will not meet the requirements of the standard upon final inspection. When this situation occurs the labels bearing the official identification marks must be stripped from the packages.

The new procedure for removal of labels bearing inspection marks is described in a new paragraph (e) added to §260.86 (Approved Identification) of the regulations for processed fishery products. At the time a lot of fishery products is found to be mislabeled and the labels on the packages are not removed immediately, the procedure will be: (1) The processor, under the supervision of the inspector, shall clearly and conspicuously mark all master cases in the lot by means of a "Rejected by USDI Inspector" stamp provided by the Department. (2) The processor shall be held accountable to the Department for all mislabeled products until the products are properly labeled. (3) Clearance for the release of the relabeled products shall be obtained by the processor from the inspector.

Interested persons had until March 26, 1962, to submit comments, suggestions, or objections to the U.S. Bureau of Commercial Fisheries.

SELECTIONS MADE FOR FISHERY RESEARCH FELLOWSHIP GRANTS:

Seventeen two-year graduate educational grants in aquatic sciences have been awarded to 12 universities by the U. S. Fish and Wildlife Service's Bureau of Commercial Fisheries, the U. S. Department of the Interior announced on March 4, 1962. This new program seeks to attract and assist the scientific manpower necessary to further the Bureau's objectives and also aid the National Oceanographic Program, particularly in the field of fishery research.

Selections were made by Bureau officials and a panel of consultants from leading universities and private research organizations who advised the Bureau on the relative qualifications of institutions and faculties within each of five general professional fields in which highly qualified scientists will be needed in the near future. These are: physical or chemical oceanography, biological oceanography or marine biology, fishery biology, taxonomy, and food technology.

Invitations to participate in the program recently were sent qualified educational institutions. Applications were received from 25 universities for the support of 77 students. Although nearly all applications were deemed qualified, the small number of grants available necessitated the decision to support

only one research endeavor in a specific field in each institution.

The universities selected, the number of grants awarded each, and the research fields involved are:

University of Washington, three grants, physical or chemical oceanography, fishery biology, and food technology; Oregon State University, two grants, physical oceanography and food technology; University of California, two grants, physical oceanography and biological oceanography; University of Hawaii, one grant, fishery biology; University of Michigan, one grant, taxonomy; Massachusetts Institute of Technology, one grant, food technology.

University of Rhode Island, one grant, physical oceanography or biological oceanography; Yale University, one grant, biological oceanography or fishery biology; The Johns Hopkins University, one grant, physical or chemical oceanography; Duke University, one grant, marine biology; University of Miami, two grants, physical oceanography and fishery biology; and Texas Agricultural and Mechanical College, one grant, physical oceanography.

Graduate students who will receive the grants will be chosen by the universities. All tuition and fees will be paid, and each student will receive \$3,000 for living expenses on a 12-month basis. Married students with children will receive an additional \$1,000 family allowance.



Small Business Administration

GOVERNMENT AID FOR DISASTER VICTIMS IN MIDDLE ATLANTIC AREA:

The Small Business Administration has announced that its low-interest, long-term disaster loans will be made available to property owners in all areas of New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, and possibly Florida, that suffered damage from high tides, rain, or floods caused by the early March storms on the Eastern seaboard.

Information concerning the loans to help residents restore their homes and business establishments, including shore-based facilities of the fishing industry, may be obtained from the following SBA offices:

Regional Office
42 Broadway
New York, N. Y.

Branch Office
Rm. 611, Calvert Bldg.
Baltimore, Md.

Regional Office
Jefferson Bldg.
1015 Chestnut St.
Philadelphia, Pa.

Branch Office
Independence Bldg.
West Trade Street
Charlotte, N. C.

Regional Office
900 N. Lombardy St.
Richmond, Va.

Branch Office
1745 Sumter St.
Universal Bldg.
Columbia, S. C.

Temporary offices to receive loan applications are located in Atlantic City, Ship Bottom, and Wildwood, New Jersey, and Rehoboth Beach, Del. Additional temporary offices were to be established. SBA disaster loans are made at 3 percent interest with terms up to 20 years for repayment.

The Department of the Interior Fisheries Loan Fund available for fishing vessel construction and operation contains no provision for disaster loans. However, loans for the replacement or repair of vessels in the disaster areas can be made in accordance with the regular provisions under the Fisheries Loan Fund regulations. These loans are made at 5 percent interest for periods up to 10 years.



Department of State

AGENCY FOR INTERNATIONAL DEVELOPMENT

ASSISTANCE TO UNITED STATES BUSINESS FOR FOREIGN INVESTMENT SURVEYS:

Procedures for carrying out a Congressional authorization to encourage United States business to undertake surveys of investment opportunities in less-developed countries were announced on March 12, 1962, by the Administrator of the Agency for International Development (AID).

The procedures permit AID to share with private investors up to 50 percent of the cost of pre-investment surveys. AID cooperation in helping to finance such surveys was authorized by Title IV of the Act for International Development of 1961 and is designed to stimulate further investment in United States private enterprise in the newly-developing countries.

A total of \$1,500,000 is available for the cooperative enterprises during the remainder of the current fiscal year (ends June 30, 1962).

The new authority will be used to obtain surveys for potential United States investors who are directly interested in taking advantage of pre-investment surveys. It is in addition to the general authority of AID to finance surveys in cases in which no immediate investment interest is in prospect.

The initiative for pre-investment surveys may come from United States private investors, United States Government agencies through AID, or from the governments of the newly-developing countries. The surveys would explore and analyze such matters as market potential and profitability, plant location, raw material availability, labor supply, and engineering feasibility.

The procedures will operate in the following manner:

If the initiative for a survey comes from a potential private investor, AID will reimburse the investor 50 percent of the survey's cost if the investor decides against proceeding with the investment. In this case, the survey would become the property of AID and AID could make the survey available to other potential investors. In the event

the survey is used by the investor who initiated it, it would become his property and he would assume the entire cost of the survey.

If the initiative for the survey comes from the AID agency itself or from the government of a friendly less-developed country, AID will reimburse the potential investor selected for the project 50 percent of the cost regardless of whether he decides to proceed with it. If the investor decided to proceed, the survey would become his property. If he decided against proceeding, it would become AID's property for such use as the Agency deemed appropriate.

Procedures to be followed for pre-investment surveys are outlined in the Agency's Policy Guideline No. 1, Investment Surveys, issued March 1, 1962. For a copy of the Guideline and further information, write to the Private Enterprise Division, Office of Development Financing, Agency for International Development, Washington 25, D. C.



Eighty-Seventh Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are re-



ported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ALASKA FISHERIES: A statement by Senator Gruening of Alaska before the Subcommittee on Interior and related agencies of the Senate Committee on Appropriations, March 13, 1962, was printed in the Congressional Record of that same date (pp. 3567-3584). As part of the statement there is a section on Alaska fisheries. In addition there is included a summary of United States funds expended on creating, or developing, or rehabilitating the fisheries of 21 foreign nations.

On March 19, 1962, the House and Senate were presented with a joint resolution of the Legislature of the State of Alaska (Senate Joint Resolution 44) urging the Congress of the United States to appoint a special joint Congressional Committee to investigate the Alaskan fishing industry and the necessity for Federal financial support; that the Federal Government allocate emergency funds immediately to support intense scientific research programs in Alaska to aid the conservation and improvement of the fisheries. The resolution was referred to the Senate Committee on Commerce and the House Committee on Rules.

ANTIDUMPING ACT AMENDMENT: H. R. 10479 (Tupper) was introduced in the House February 28, 1962, to amend certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes. Also introduced in the House on March 5, 1962, H. R. 10534 (Curtin) and H. R. 10626 (Philbin) March 8,

1962; all bills were referred to the Committee on Ways and Means. Similar to several other bills previously introduced.

FISHING VESSEL DISASTER LOANS: H. R. 10729 (Boykin) was introduced in the House on March 14, 1962, to provide disaster loans to fishing vessel owners and operators adversely affected by failure of the fishery resource, and for other purposes. Would authorize the Secretary of Interior to make loans to fishing vessel owners or operators where he finds that a fishery production or resource disaster, or where other unforeseen disaster arising from natural causes, has caused a need by such owners or operators for credit that is not available from commercial banks, cooperative lending agencies, or other sources on terms reasonable to meet such needs. Referred to the Committee on Merchant Marine and Fisheries.

FISH PROTEIN CONCENTRATE: Senator Saltonstall on February 21, 1962, in the Senate brought to the attention of that body the current conflict of whole fish protein concentrate or fish flour. He stated, in part, "It seems regrettable to me that the Food and Drug Administration should interpose objections to this product..."

"The Department of the Interior is on record in favor of this product. The U. S. Patent Office has issued at least three patents on it, and this required a legal finding that the invention will be new and useful. Our civil defense officials are aware of the reliable stability and nutrient qualities of this food, and 10 Members of this body have spoken out in favor.

"I am advised that official objection to the substitute standard offered by the Food and Drug Administration will be filed on today and that a public hearing will be requested.

"I associate myself with this petition, and with my colleagues to urge that all agencies of the Federal Government unite on a scientific and forward-looking answer to this question..."

Senator Saltonstall included (in the Congressional Record of February 21, 1962, p. 2508) as part of his remarks some statements made by people in the field of nutrition on fish protein concentrate. He pointed out that the statements are being filed as an appendix to the petition.

On March 1, 1962, Senator Young of Ohio referred to the fish protein concentrate studies. He requested and was granted permission to have reprinted in the Congressional Record on March 1, 1962 (p. 2900) two articles which appeared in the Celina (Ohio) Daily Standard on fish protein concentrate.

Senator Douglas in the Senate on March 8, 1962, stated that he had been informed by the Food and Drug Administration that his appeal filed in opposition to the proposed order for a standard of identity on fish flour had been one of three successful appeals. Food and Drug further informed Senator Douglas that a public hearing will be held when an impartial, competent hearing examiner is obtained. The Senator's appeal in the form of a letter to the Department of Health, Education, and Welfare was printed in the Congressional Record of March 8, 1962 (p. A1764).

H. R. 10587 (Bates) introduced to the House on March 7, 1962, to amend clause (3) of section 402(a)

of the Federal Food, Drug, and Cosmetic Act. Would amend chapter 4--Food--section 402 (Adulterated Food) of the Federal Food, Drug, and Cosmetic Act as amended which spells out what makes the food adulterated. It would provide that processed seafood products can be produced from whole fish. To the particular portion of the section which now reads. . . "(3) if it consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food," the bill would add the following exception: "but no processed seafood product shall be deemed to consist of any such substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof." Identical bills H. R. 9101 and H. R. 9102 were introduced in the House on September 7, 1961.

GAME AND FOOD FISH CONSERVATION IN DAM RESERVOIRS: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings February 7, 1962, on H. R. 2722, to establish a research program in order to determine means of improving the conservation of game and food fish in dam reservoirs. Testimony was heard from Representative Miller. On the same date the bill was passed over without prejudice by the Committee.

INDIAN FISHING RIGHTS: H. J. Res. 657 (Westland) introduced in the House on March 12, 1962, a joint resolution regarding Indian fishing rights; to the Committee on Interior and Insular Affairs. Proposes to solve the problem of treaty or nontreaty Indians fishing off the reservation in violation of the State regulations. In furtherance of the purposes of any treaty with American Indians, the States involved are authorized to enact and to enforce laws of a regulatory nature concerning the time and manner of fishing outside an Indian reservation that are necessary for conservation of fish, and that are equally applicable to Indians and all other citizens without distinction.

INTERIOR APPROPRIATIONS: The Senate Committee on Appropriations Interior Subcommittee, February 26, 1962, began hearings on fiscal 1963 budget estimates for the Department of the Interior, and related agencies, with testimony from Secretary of the Interior Stewart Udall. On March 2, 1962, testimony on funds for the Fish and Wildlife Service was heard from the Special Assistant to the Commissioner, Director, Bureau of Commercial Fisheries, and the Director, Bureau of Sport Fisheries and Wildlife. On March 13, 1962, the Subcommittee concluded its hearings on fiscal 1963 budget estimates for the Department of the Interior, and related agencies. Subcommittee recessed subject to call.

Department of the Interior and Related Agencies Appropriations for 1963 (Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, Eighty-Seventh Congress, Second Session, on appropriations for the Department of Interior except Bonneville Power Administration, Bureau of Reclamation, Southeastern Power Administration, and Southwestern Power Administration), 1,576 pp., printed. Included is the testimony for funds for the Fish and Wildlife Service: the Commissioner's Office and its two bureaus, Sport Fisheries and Wildlife, and Commercial Fisheries.

The House on March 15, 1962, granted permission to the Committee on Appropriations to file a report by midnight March 16, 1962, on the bill making appropriations for the Department of Interior and related agencies for fiscal year 1963. The House Committee on Appropriations met in executive session on March 16, 1962, on Interior and related agencies appropriations for 1963.

H. R. 10802 (Kirwan) introduced in the House March 16, 1962. The bill was reported favorably (H. Rept. 1446) to the House by the Committee on Appropriations on the same date. The Committee recommended a total of \$64,164,000 for Fish and Wildlife Service funds for FY 1963, against the budget estimate of \$64,646,000 and \$51,651,150 for 1962 appropriations. The Bureau of Commercial Fisheries portion for FY 1963 is \$24,150,000, against \$25,293,000 for the budget estimate and \$21,643,000 for 1962 appropriations; the Bureau of Sport Fisheries and Wildlife portion for FY 1963 is \$39,650,000 as compared with \$38,989,000 for the budget estimate and \$29,644,150 for fiscal year 1962; the Office of the Commissioner amount for FY 1963 is \$364,000, the same amount as the budget estimate and the appropriations for 1962.

The House on March 20, 1962, passed, by voice vote, without amendment, H. R. 10802, making appropriations for the Department of the Interior and related agencies for fiscal year 1963.

IRRADIATED FOOD PROGRAM: The Joint Committee on Atomic Energy's Subcommittee on Research, Development, and Radiation on March 6, 1962, began hearings on the status of the food irradiation program of the Atomic Energy Commission and the Army. Testimony was heard from personnel of both agencies.

METRIC SYSTEM STUDY: On March 5, 1962, the House passed H. R. 2049 (Miller) to provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures.

NATURAL RESOURCES CONSERVATION MESSAGE FROM THE PRESIDENT: On March 1, 1962, the Senate and House received a conservation message from the President. In the introduction the President, in part, states: "... We depend on our natural resources to sustain us--but in turn their continued availability must depend on our using them prudently, improving them wisely, and, where possible, restoring them promptly. We must reaffirm our dedication to the sound practices of conservation which can be defined as the wise use of our natural environment; it is, in the final analysis, the highest form of national thrift--the prevention of waste and despoliation while preserving, improving, and renewing the quality and usefulness of our resources..." The President in indicating the progress made this past year said: "... A full-scale attack on one of the most destructive forms of waste--water pollution--has been mounted under the 1961 amendments to the Water Pollution Control Act." He also stated that he proposed to convene a White House Conference on Conservation this year to seek the best possible advice in prescribing what must be done in the future on conservation of natural resources. The major sections of the message cover outdoor recreation resources; water resources; public lands; soil, watershed, and range resources; timber resources; minerals; power; and research and technology. Under the

section of outdoor recreation resources the President recommends approval of legislation along the lines of S. 543, as approved by the Senate, to authorize a study of the ocean, lake, and river shorelines of the Nation.

Under the section on research and technology the President states: "... Implicit in the conservation thesis of wise use, improvement, preservation and restoration of our resources is the basic requirement of greater scientific knowledge and improved resources management. The catalog of resource problems set forth in this message demonstrates the importance of intensive research in the resources field. In response to the demonstrated need for concentrated and coordinated research, this administration has requested the National Academy of Sciences to undertake a thorough evaluation of the potentials and needs for research underlying the development and use of natural resources; directed the Federal Council for Science and Technology to coordinate the wide-ranging research programs of participating agencies to strengthen and unify our total governmental research effort in the natural resources field; and directed the Council of Economic Advisors to stimulate research in the economics of resource use.

"Coordinated research programs already underway and worthy of special note are the following:

"Oceanography: Our intensified effort to expand our knowledge and understanding of the vast resources held by the oceans through basic research and surveys of geologic and living resources will surely result in extending our known resource base, with encouraging prospects for improving our standard of living and adding protein-rich marine products to the diets of the hungry people of the world.

"Sports Fisheries and Wildlife: Studies of diseases and pesticides are continuing and efforts to solve the problems of passing migratory fish over high dams are being accelerated. A new laboratory has been opened on the Atlantic coast to study the management of salt-water sport fish--the basis of a growing industry..."

The message (printed as H. Doc. No. 348) was referred by the House to the Committee of the Whole House on the State of the Union and referred by the Senate to the Committee on Interior and Insular Affairs.

NORTH PACIFIC AND BERING SEA FISHERIES: The House on March 12, 1962, received a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States relative to the initiation of Federal studies and programs regarding the condition and exploitation of the North Pacific and Bering Sea fisheries; referred to the Committee on Merchant Marine and Fisheries.

The Senate on March 13, 1962, was presented with a House Joint Resolution 30 from the Legislature of the State of Alaska; referred to the Committee on Commerce. The resolution memorializes the President and the Congress of the United States relative to the initiation of Federal studies and programs regarding the condition and exploitation of the North Pacific and Bering Sea fisheries.

NORTH PACIFIC FISHERIES COMMISSION: The House and Senate on March 19, 1962, received a resolution of the Senate of the State of Alaska (Senate Res-

olution 47) commending the work of the International North Pacific Fisheries Commission. The resolution most highly commends the intergovernmental cooperation and accomplishment of the International North Pacific Fisheries Commission in its efforts to conserve and beneficially utilize the North Pacific fisheries through fishery and oceanographic research, and pledges Alaska's full support to the Commission and the Federal Government for the furtherance of its work, and urges that the financial support for its activities be expanded through the efforts of the President and the Congress of the United States. Referred to the House Committee on Merchant Marine and Fisheries and the Senate Committee on Commerce.

NORTH PACIFIC FISHERIES PROBLEMS: Problems of the North Pacific Fisheries, Part I (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, Eighty-Seventh Congress, First Session), 257 pp., printed. Contains hearings held October 4, 1961, at San Rafael, Calif., and October 12, 1961, at Seattle, Wash. Statements were presented by Government personnel and members of the fishing industry.

Problems of the North Pacific Fisheries, Part II (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, Eighty-Seventh Congress, First Session), 646 pp., printed. Contains hearings held on Oct. 13, 16, 17, 18, 20, 21, 24, 25, 26, and 27, 1961. Testimony was received on the problems of the North Pacific fisheries; and H. R. 7490, an act for the protection of marine mammals on the high seas and for other purposes; and supplemental testimony on S. 1230, to amend the Saltonstall-Kennedy Act so as to establish an additional fund for fishery research programs and fisheries rehabilitation and development projects and for other purposes. The hearings were held in the following locations: Petersburg, Dillingham, Homer, Naknek, Fairbanks, Anchorage, Cordova, Juneau and Ketchikan, Alaska.

OCEANOGRAPHY: The Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries met February 27, 28, and March 1, 1962, to study the operation of the Subcommittee on Oceanography of the Federal Council for Science and Technology. On February 28 testimony was heard from the Assistant Secretary of the Navy for Research and Development regarding the operations of the Subcommittee on Oceanography of the Federal Council for Science and Technology. On March 2, 1962, the Subcommittee concluded a study of operation of the Subcommittee on Oceanography, Federal Council for Science and Technology. Testimony was heard from officials of the departmental subcommittee. The Subcommittee met again on March 13, 1962.

Two bills concerning oceanographic research are now pending before the Subcommittee: S. 901 which was passed by the Senate last year, with amendments, would establish a national 10-year program of oceanographic research and surveys; H. R. 4276 would establish a National Oceanographic Council.

OYSTER BROOD STOCK PURCHASES: The House Committee on Merchant Marine and Fisheries Subcommittee on Fisheries and Wildlife Conservation on March 7, 1962, reported favorably to the full committee, H. R. 7336 (amended). In the amended bill the Secretary of the Interior is authorized with respect to those States

where he finds that excessive mortality of oysters presents an immediate and substantial threat to the economic stability of the oyster industry in such area or region, to acquire oyster brood stock that he believes possesses resistance to the causative agent of such excessive mortality. The purchase of oyster brood stock by the Secretary shall be conditional upon the participating State or States paying one-third of the cost. The amended title of the bill shall be "A bill to promote the production of oysters by propagation of disease-resistant strains, and for other purposes."

The House Committee on Merchant Marine and Fisheries March 15, 1962, met in executive session and ordered reported favorably to the House H. R. 7336 (amended). The Committee on March 19, 1962, reported the bill favorably (H. Rept. 1449) to the House; referred to the Committee of the Whole House on the State of the Union.

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: H. J. Res. 644 (Tuck) introduced in the House February 27, 1962, granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958; to the Committee on the Judiciary. Would replace an agreement of 1785 on the fisheries of the Potomac River. The Maryland Legislature unilaterally abrogated the old agreement in 1957. Provides for a Commission charged with the establishment and maintenance of a program to conserve and improve the tidewater portion of the Potomac River fishery resources. Commission will have the power to make, adopt, and publish rules and regulations for its meetings, hearings, and administration. Commission may impose an inspection tax, not exceeding 25 cents per bushel, on all oysters caught in the Potomac River, to be paid by the buyer at the point of unloading in Virginia or Maryland. Commission may issue regulations regarding fishing in the area under its control but leasing, dredging, or patent tonging shall be authorized by the Commission only if authorization is granted by joint action of the legislatures of Virginia and Maryland. Regulations and orders of the Commission shall be enforced by the joint effort of the law enforcement agencies of Maryland and Virginia. The laws of Maryland on finfish, crabs, oysters, and clams in the Potomac River as in effect on December 1, 1958, remain applicable in the Potomac River to the extent changed, amended, or modified by regulations of the Commission. Maryland's more stringent conservation laws will be adopted for both states and both will be required to appropriate money for development of oysters and other resources as well as to share joint responsibility for policing the river. On March 13, 1962, a similar resolution, H. J. Res. 659, was introduced in the House. Referred to the Committee on the Judiciary.

PRICE-QUALITY STABILIZATION: H. R. 10335 (Madden) introduced in the House February 21, 1962, to the Committee on Interstate and Foreign Commerce; to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes. It provides that the owner of a brand, name, or trademark shall be deemed to retain his property rights therein, regardless of any sale or transfer of the goods to which such brand, name, or trademark relates, and no such sale or transfer shall

be deemed to diminish or extinguish any such rights. The owner of such brand, name, or trademark may revoke the right of the reseller by written notice if the person reselling the goods has employed the goods in furtherance of bait merchandising practices; has advertised, offered for sale, or sold such goods at prices other than such currently established resale prices; or has sold such goods with the intent to deceive purchasers, has published misrepresentation concerning such goods. Similar or identical bills introduced in the House: February 21, 1962: H. R. 10340 (Holifield); H. J. Res. 636 (Harris); H. J. Res. 637 (Mack); H. J. Res. 639 (Tollefson); March 1, 1962, H. R. 10517 (McMillan); all to the Committee on Interstate and Foreign Commerce. Also introduced in the Senate February 21, 1962, S. J. Res. 159 (Humphrey and others), to the Committee on Commerce.

SAFETY OF LIFE AT SEA CONVENTION: The Senate Committee on Foreign Relations held a hearing on February 27, 1962, on Executive K (87th Congress, 1st session), the International Convention for Safety of Life at Sea. The convention was signed in London on January 17, 1960, by the United States and transmitted to the Senate for advice and consent thereto on April 27, 1961. When it enters into force, it will supersede the present convention of 1948 on the same subject. Testimony was heard from the Deputy Assistant Secretary of State for Economic Affairs, and Commandant, U. S. Coast Guard.

SALTONSTALL-KENNEDY ACT FUNDS REAPPORTIONMENT: H. R. 10348 (Tupper) introduced in the House February 21, 1962, to the Committee on Merchant Marine and Fisheries; to amend the Saltonstall-Kennedy Act so as to establish an additional fund for fishery research programs and fisheries rehabilitation and development projects, and for other purposes. This provides that an amount equal to 30 percent of the gross receipts collected on fishery products imports shall be annually apportioned by the Secretary of the Interior on a 75 percent Federal and 25 percent state matching fund basis among those states with commercial fishing, on a percentage basis. The percentage basis is determined by the ratio which the average of the value of raw fish landed within each state for the three most recent consecutive years plus the average of the value to the manufacture of processed products within each state for the three most recent consecutive years bears to the total average value of all raw fish landed and products processed for the three most recent years within all participating states. One proviso is that funds granted shall not be used to supplant state and local funds made available for the same purpose. It is identical to S. 1230, with one exception—the Tupper bill provides that for every \$75 a state receives from the Federal Government under this bill, it must contribute an additional \$25.

SHELLFISH PROCESSING EXEMPTION FROM MINIMUM WAGE: The House Special Subcommittee on Labor conducted hearings February 9, 1962, on H. R. 8927, H. R. 8932, H. R. 8933, H. R. 8930, and similar bills. The Chairman indicated that his Committee would hesitate to open the door to reduce minimum wages, but stated that he recognized the particular problems confronting the blue crab and oyster industries and that the Committee would try through the Department of Labor to find some means of relief.

TARIFF CLASSIFICATION RESTATEMENT IN TARIFF ACT OF 1930: The House Committee on Ways and

Means on February 28, 1962, directed the chairman to introduce a clean bill, H. R. 10607, in lieu of H. R. 9189, to provide for the restatement of the tariff classifications provisions and for other purposes. The Committee on March 8, 1962, ordered reported favorably to the House H. R. 10607. On the same date H. R. 10607 (Mills) was introduced in the House.

The House on March 10, 1962, received from the Committee on Ways and Means a favorable report (H. Rept. No. 1415) on H. R. 10607; referred to the Committee of the Whole House on the State of the Union.

H. Rept. 1415, Tariff Classification Act of 1962 (March 10, 1962, Report of the Committee on Ways and Means, House of Representatives, 87th Congress, 2nd Session, to accompany H. R. 10607), 12 pp., printed. Committee reported bill favorably, without amendment, and recommends passage. Report presents purpose, background, summary, and technical explanation of the bill.

The House Committee on Rules on March 13, 1962, granted a closed rule, waiving points of order, with 3 hours debate on H. R. 10607. The Committee reported to the House on the same date House Resolution 564 (Sisk), for the consideration of H. R. 10607 without amendment (H. Rept. No. 1429), referred to the House Calendar.

On March 14, 1962, the House by a voice vote passed without amendment H. R. 10607. This action followed the adoption by the House of H. Res. 564. H. R. 10607 provides for the adoption and implementation of revised tariff schedules proposed pursuant to law by the U. S. Tariff Commission and to make certain amendments in existing law necessitated by the adoption of such revised schedules. It would accomplish the following: (1) Establish schedules of tariff classification which will be logical in arrangement and terminology and adapted to the changes which have occurred since 1930 in the character of importance of articles produced in and imported into the United States and in the markets in which they are sold. (2) Eliminate anomalies and illogical results in the classification of articles. (3) Simplify the determination and application of tariff classifications.

TRADE EXPANSION ACT OF 1962: The House Committee on Ways and Means began public hearings on

March 12, 1962, for the purpose of receiving testimony on the President's reciprocal trade agreements proposal. This proposal is contained in H. R. 9900, the "Trade Expansion Act of 1962," to provide assistance to business enterprises and individuals to facilitate adjustments made necessary by the trade policy of the United States. The purpose is to offset the impact on American businesses, especially smaller businesses, of a more liberal national trade policy by a broad-gauge program of adjustment assistance. Information on presenting testimony to the committee on this proposed legislation was contained in a February 16, 1962, press release titled "Chairman Wilbur D. Mills (D. Ark.), Committee on Ways and Means, House of Representatives, Announces Public Hearings on President's Reciprocal Trade Agreements Proposal." Also, "A Summary of New Trade Legislation as Sent by the President to the Congress, January 25, 1962," accompanied the press release.

VESSEL COLLISION LIABILITY: The Senate Committee on Commerce, Subcommittee on Merchant Marine and Fisheries, on March 1 and 2, 1962, held hearings on S. 2313, to unify apportionment of liability in cases of collision between vessels. Testimony was heard from various members of industry and Government administrators. Hearings were adjourned subject to call.

VESSEL OWNERS LIABILITY: The Senate Committee on Commerce Subcommittee on Merchant Marine and Fisheries on March 1 and 2, 1962, held hearings on S. 2314 to limit the liabilities of shipowners. Members of industry and Government administrators gave testimony. Hearings were adjourned subject to call.

VESSEL TRANSFER: The Senate on March 1, 1962, considered and passed with amendment H. R. 3788, to provide for the transfer of the United States vessel Alaska to the Department of Fish and Game of the State of California. The amendment makes the transfer conditional upon the State of California paying the Federal Government an amount equal to fifty percent of the fair market value of the vessel at the time it was leased by the State in California; it also provides that if the vessel should cease to be used for a public purpose, all right, title, and interest therein shall revert to the United States. This same bill without the amendment passed the House on August 21, 1961.



FISH EGGS SHIPPED ABROAD

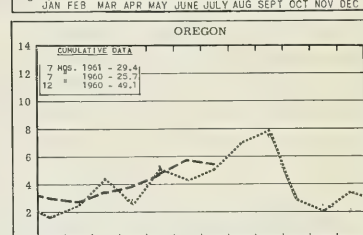
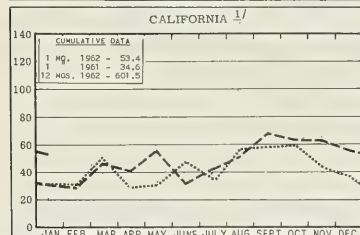
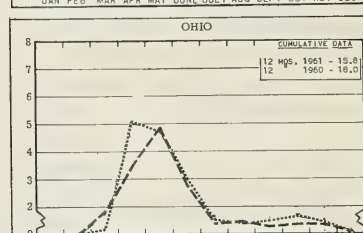
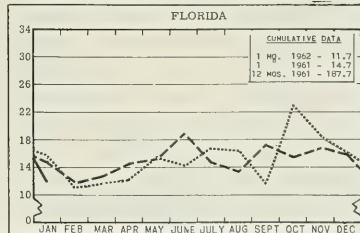
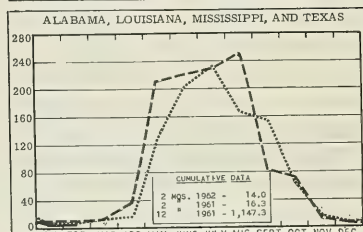
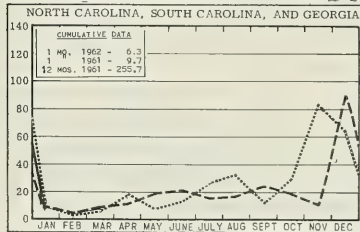
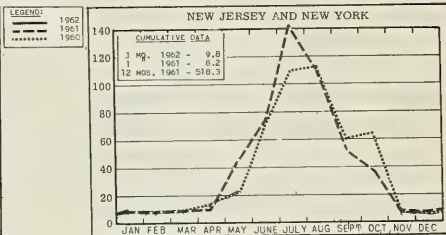
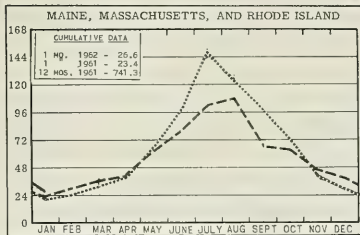
Shipments of trout eggs in 1961 to foreign countries included the following: 14,000 brook trout eggs from Walhalla, S. C., National Fish Hatchery to the Provincial Administration of the Cape of Good Hope, South Africa Republic, and 100,000 rainbow trout eggs from the Wytheville, Va., National Fish Hatchery to Nova Scotia. A shipment of 100,000 rainbow trout eggs from the Winthrop, Wash., National Fish Hatchery to the Ministry of Agriculture, San Jose, Costa Rica, left Portland, Oreg., by air on February 6, 1962, and arrived in San Jose the following day.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

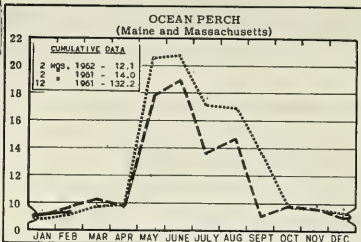
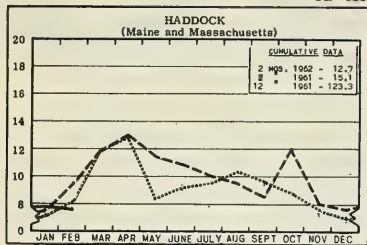
In Millions of Pounds



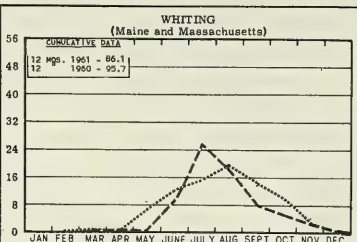
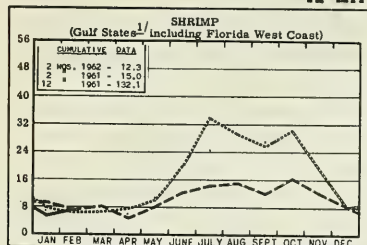
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

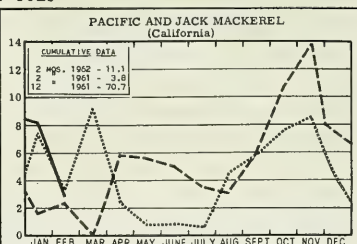
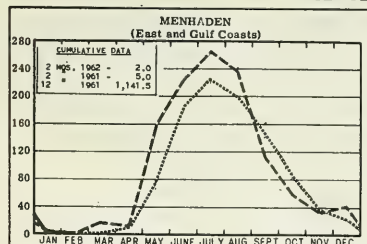


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

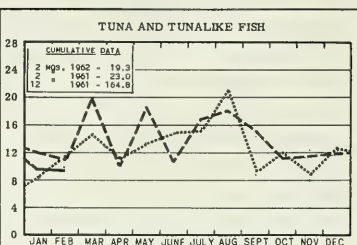
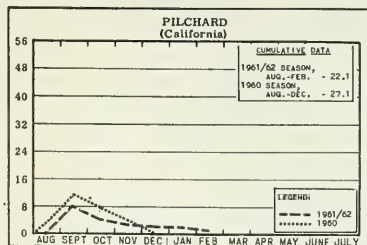
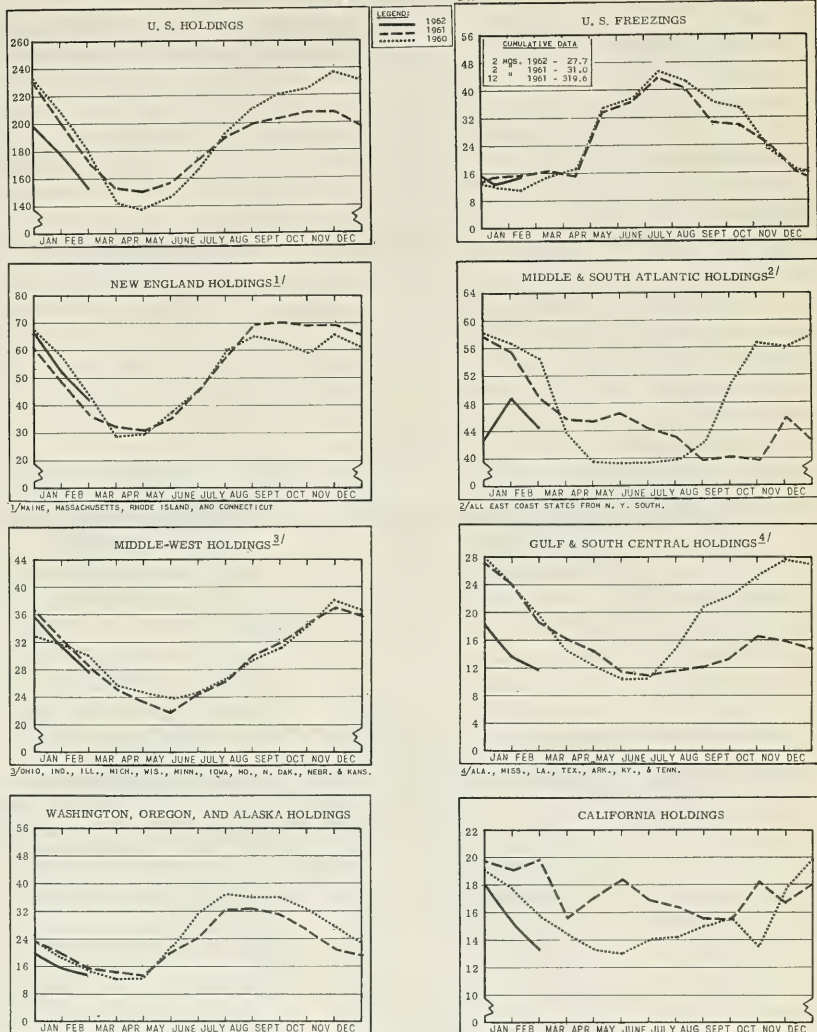


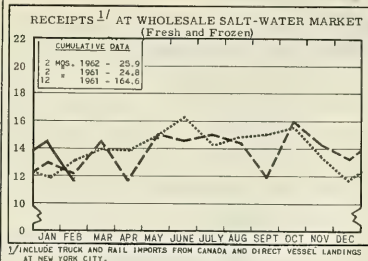
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds

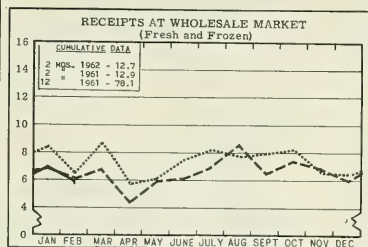
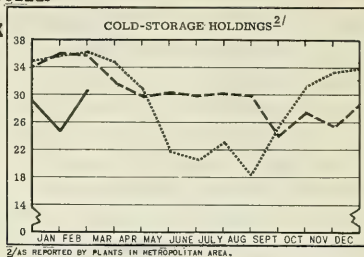


* Excludes salted, cured, and smoked products.

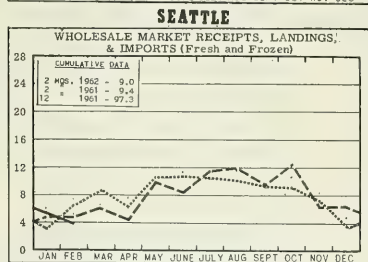
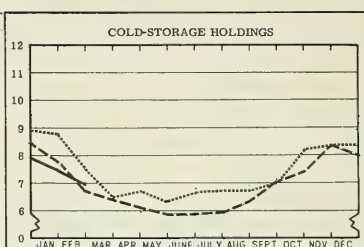
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS In Millions of Pounds



NEW YORK CITY



CHICAGO



LEGEND:

— 1962
- - - 1961
... 12 MOS. 1961

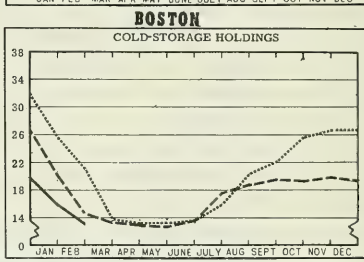


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

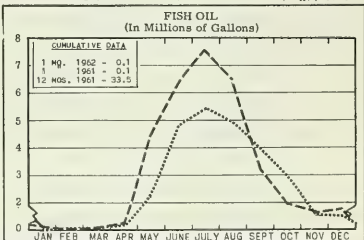
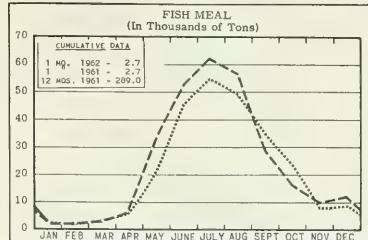
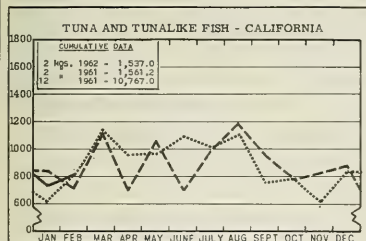


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases

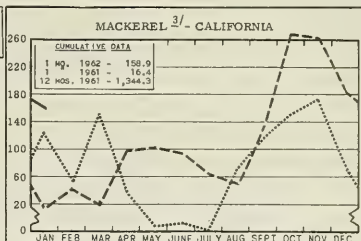


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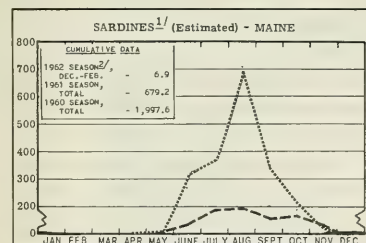
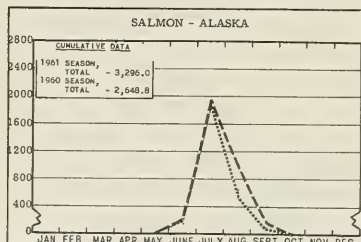
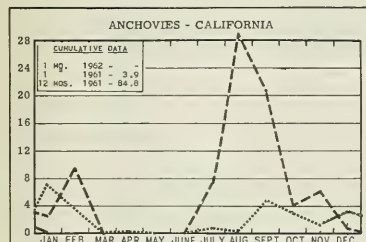
— 1961

- - - 1962

..... 1963



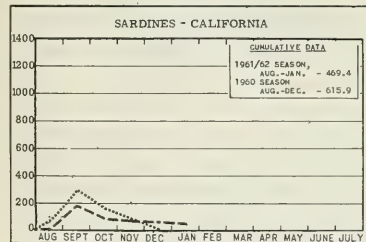
3/- INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:

- - - 1961/62

..... 1960/61

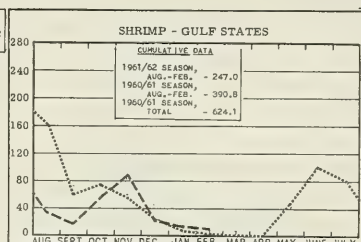
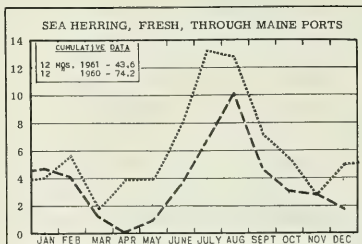
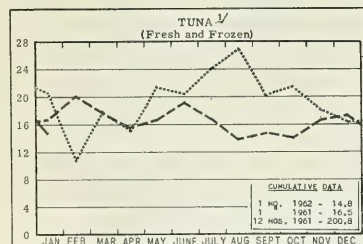
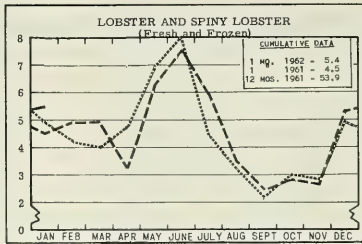
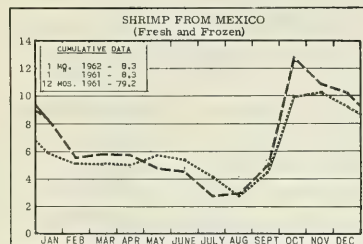
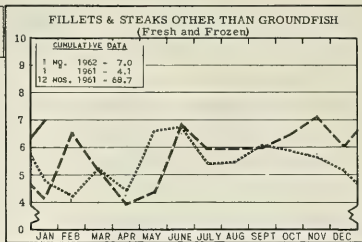
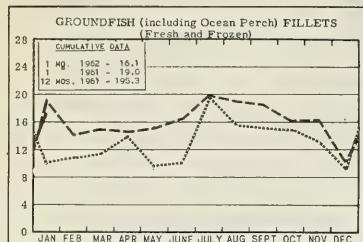
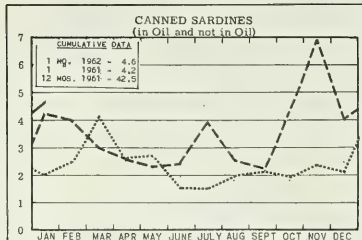
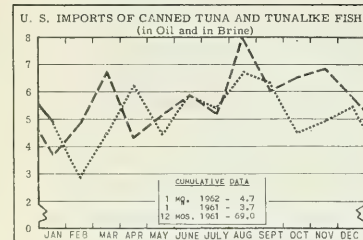


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/2} EXCLUDES LOINS AND DISCS.





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE
OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASH-
INGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES
(LIMITED DISTRIBUTION).

- | Number | Title |
|----------|----------------------------------------------------------------|
| CFS-2767 | - Massachusetts Landings, September 1961, 5 pp. |
| CFS-2773 | - Alabama Landings, August 1961, 3 pp. |
| CFS-2780 | - Mississippi Landings, October 1961, 2 pp. |
| CFS-2781 | - Frozen Fish Report, December 1961, 8 pp. |
| CFS-2783 | - Rhode Island Landings, October 1961, 3 pp. |
| CFS-2785 | - Alabama Landings, September 1961, 3 pp. |
| CFS-2786 | - Michigan Landings, November 1961, 2 pp. |
| CFS-2787 | - California Landings, September 1961, 4 pp. |
| CFS-2788 | - Ohio Landings, November 1961, 2 pp. |
| CFS-2789 | - Maine Landings, November 1961, 4 pp. |
| CFS-2790 | - California Landings, October 1961, 4 pp. |
| CFS-2791 | - Minnesota Landings, November 1961, 2 pp. |
| CFS-2792 | - Louisiana Landings, September 1961, 2 pp. |
| CFS-2793 | - Alabama Landings, October 1961, 3 pp. |
| CFS-2794 | - New York Landings, November 1961, 5 pp. |
| CFS-2795 | - Pacific Coast States Fisheries, 1960, Annual Summary, 6 pp. |
| CFS-2797 | - Rhode Island Landings, November 1961, 3 pp. |
| CFS-2798 | - Ohio Landings, December 1961, 2 pp. |
| CFS-2799 | - Mississippi Landings, November 1961, 2 pp. |
| CFS-2801 | - Fisheries of the United States, 1960, Annual Summary, 18 pp. |
| CFS-2802 | - Mississippi River Fisheries, 1960, Annual Summary, 9 pp. |
| CFS-2803 | - New Jersey Landings, December 1961, 4 pp. |
| CFS-2804 | - Maryland Landings, December 1961, 3 pp. |
| CFS-2805 | - Louisiana Landings, October 1961, 2 pp. |
| CFS-2807 | - Alabama Landings, November 1961, 3 pp. |
| CFS-2809 | - South Carolina Landings, December 1961, 2 pp. |
| CFS-2812 | - Texas Landings, November 1961, 3 pp. |
| CFS-2817 | - Wisconsin Landings, December 1961, 2 pp. |

FL-523 - Spiny Lobsters, by Lola T. Dees, 7 pp., illus., September 1961. Discusses the commercially valuable species of spiny lobster, their physical characteristics, sexual differences and behavior, food and feeding, habits, molting and growth, reproduction, and the young. Also discusses migrations, enemies and protection against them, methods of capture, utilization of the catch, and efforts at culture.

FL-525 - The Mosquitofish, Gambusia affinis, by Lola T. Dees, 5 pp., illus., September 1961.

FL-527 - Brine Shrimp, by Lola T. Dees, 5 pp., illus., September 1961. Discusses the species and occurrence of brine shrimp, its life history, and commercial utilization. Also discusses the collection, processing, hatching, and rearing of brine shrimp. A list of suppliers located in the United States of brine shrimp eggs is included.

FL-532 - Advance Report on the Fisheries of the United States, 1961, by E. A. Power, 25 pp., January 1962.

SSR-Fish. No. 394 - Annual Fish Passage Report--Rock Island Dam, Columbia River, Washington, 1959, by Paul D. Zimmer, Clifton C. Davidson, and Floyd S. Anders, 16 pp., illus., August 1961.

Dep. No. 642 - Blue Crab Trawl Fishery of Georgia.

Dep. No. 643 - Comparison of pH, Trimethylamine Content, and Picroic Acid Turbidity as Indices of Iced Shrimp Quality.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE
BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S.
FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

- | Number | Title |
|--------|------------------------------------------------------------------------------------------------------------------------|
| MNL-65 | - The Inshore Fishing Industry of South Africa, and South West Africa: Its Structure, Resources, Economy, etc., 10 pp. |

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3630, HONOLULU, HAWAII.

Coastal Wind Currents and the Theory of Ekman, by K. N. Fedorov, 7 pp., illus., processed, December 1961. (Translated from Russian, Izvestiia of the Academy of Sciences of the USSR, Geophysical Series, No. 8, 1959.)

The Pycnocline in Variable Currents, by K. N. Fedorov, 7 pp., illus., processed, December 1961. (Translated from Russian, Academy of Sciences of the USSR, Oceanology, vol. 1, no. 1, 1961, pp. 25-29.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION BUT IS AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3630, HONOLULU, HAWAII.

Geographical Zones in the Pelagial of the Central Pacific Ocean (From Material from the 26th Cruise of the Vitiaz), by V. G. Bogorov, 11 pp., processed, December 1961. (Translated from Russian, Academy

of Sciences of the USSR. Works of the Institute of Oceanology, vol. 41, 1960, pp. 8-16.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF.

Report of Research Vessel SHOYO MARU--1960, Trans-lation Series No. 4, 13 pp., illus., processed. (Trans-lated from Japanese, Marine Investigations Made in Atlantic Ocean off the West and Northwest Coast of Africa; Land Investigations Made at Ports of Call and Cruise Report, pp. 16-22, 34-39.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Alaska Seafood Recipes, by Charlotte D. Speegle and Marjorie Bassett, 79 pp., illus., processed. (U. S. Fish and Wildlife Service, Fishery Products Laboratory, Box 647, Ketchikan, Alaska, 1951.) Contains brief explanations of how to purchase fish. Also shows the amount of fishery products needed to feed 50 persons. Includes recipes for preparing cod, flounder or sole, herring roe, halibut, rockfish, sablefish, salmon, smelt or eulachon, trout, clams, crabs, oysters, scallops, and shrimp. Also contains recipes for preparing fish outdoors, using kelp to prepare pickles and relish, and for making sauces and stuffing for fish. Most of the recipes are for serving six.

(Baltimore) Monthly Summary--Fishery Products, December 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, December 1961, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, December 1961, 15 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, December 1961 (Review of Chicago Wholesale Fishery Trade in 1961) and January 1962, 22 pp. and 14 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts

at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fish-ery products; for the months indicated.

Fluke Tagging, Scup (Porgy) Tagging, Tagging Bulletin, December 14, 1961, 6 pp., processed. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.) A description of recent fluke and scup (porgy) tagging programs conducted by the Woods Hole Biological Laboratory and by the State of New Jersey Department of Conservation and Economic Development. Included is brief preliminary information on the principal area where the tagged fish were caught, as well as the range of area over which they were caught.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--October and November 1961, 24 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fish-ery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, January 1962, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

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"Grading Large Numbers of Live Shrimp for Marking Experiments," by Donald M. Allen and T. J. Costello, article, *Progressive Fish-Culturist*, vol. 24, no. 1, January 1962, pp. 46-48, illus., processed, single copy 25 cents.

Resources for Tomorrow--1961 Annual Report of the Secretary of the Interior (For the Fiscal Year Ended

June 30, 1961), 473 pp., illus., printed, \$1.75. U. S. Department of the Interior, Washington 25, D. C. The first part of this report discusses the Department of the Interior's prime function of planning for the future of America and working to conserve the natural resources which sustain its life. The activities of the Department's bureaus and offices, including the United States Fish and Wildlife Service, are summarized in the second part. Among others, the accomplishments of the Bureau of Commercial Fisheries are described. Activities discussed in detail are research in salmon, tuna, biological oceanography, Great Lakes fisheries, application of atomic energy to fishery products, pesticides, fish protein and oils, fish meal, exploratory fishing, gear studies, and economic studies. Also contains information on research grants and fellowships; construction of laboratories and a new oceanographic-fishery research vessel; marketing services--standards development and inspection, market promotion, movies and demonstrations, statistical studies, and Market News reports; financial assistance--loan fund and mortgage insurance programs; foreign trade activities--tariff negotiations and fish meal promotion; Columbia River fishery program; and the fur-seal resource. A summary of the various activities of the Bureau of Sport Fisheries and Wildlife is also included.

"Separation of the Sexes of *Tilapia nilotica* with a Mechanical Grader," by Y. Pruginin and E. W. Shell, article, *Progressive Fish-Culturist*, vol. 24, no. 1, January 1962, pp. 27-40, illus., processed, single copy 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALGAE:

"Chemical Studies on Marine Algae. XIV--On a New Amino Acid, 'Chondrine,' Isolated from the Red Alga *Chondria crassicaulis*," by Mitsuo Kuriyama, Mitsuzo Takagi, and Kiichi Murata, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, August 1960, pp. 58-66, printed. Hokkaido University, Kameda-Machi, Hakodate, Japan.

"Oligosaccharides from Alginic Acid," by D. I. Vincent, article, *Chemistry and Industry*, no. 35, 1960, pp. 1109-1110, printed. Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

Overgrazing of Algae by Herbivorous Marine Fishes, by John E. Randall, 1 pp., printed. (Reprinted from *Ecology*, vol. 42, no. 4, Autumn 1961, p. 812.) Ecological Society of America, Duke University Press, Box 6697, College Station, Durham, N. C.

ALUMINUM CANS:

"Double-Bonus Can Lowers Costs, Ups Sales Appeal," article, *Food Engineering*, vol. 32, no. 11, 1960, pp. 46, 49, 50, illus., printed. Food Engineering, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

AUSTRALIA:

"Fish, Crustacean Legal Lengths," article, *Fisheries Newsletter*, vol. 21, no. 1, January 1962, pp. 15-

17, printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia. A table showing comparative minimum legal lengths of fish and crustaceans in all 6 Australian states, and the Commonwealth minimum wherever the Commonwealth has taken action at the request of a state or states. Also includes fish for which there is a minimum legal length in only one state, and thus provides the commercial fishermen of Australia with a comprehensive record of minimum lengths now in force in Australian waters.

BACTERIOLOGY:

Marine Microbiology (Deep Water), by A. E. Kriss, printed. Academy of Sciences, Moscow, U.S.S.R., 1959.

BIOCHEMISTRY:

"Report on Trimethylamine in Fish," by W. J. Dyer, article, *Journal of the Association of Official Agricultural Chemists*, vol. 42, May 1959, pp. 292-294, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Tryptophan Content of Fish Meat," by Shoji Konosu and Fumio Matsuura, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, October 1960, pp. 1040-1049, printed in Japanese. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BRAZIL:

Sudene, Boletim de Estudos de Pesca, vol. 1, no. 2, November 1961, 14 pp., illus., processed. Departamento de Estudos Especiais, Setor Pesca, Superintendencia do Desenvolvimento do Nordeste, Edifício Juscelino Kubitschek, 12º Andar, Recife, Brazil. Contains, among others, the following articles: "Fomento a Industria da Pesca (Development of the Fisheries Industry); "Estudo sobre a Biologia de Lagostas Comercializadas em Recife" (Study of the Biology of Commercial Spiny Lobsters in Recife); and "Observacoes sobre Recente Pescaria de Lagosteiros Franceses no Nordeste" (Observations on Recent Cruises of the French Spiny Lobster Vessels in the Northeast).

BYPRODUCTS:

"The Digestibility of Certain Menhaden Fish By-Products," by C. F. Bassett and R. G. Warner, article, *National Fur News*, vol. 33, no. 12, January 1962, pp. 9, 33, printed. National Fur News, Broyles, Allebaugh & Davis, Inc., 200 Clayton St., Denver 6, Colo. Discusses the relative digestibility and nutritional value of four test diets fed to groups of mink. Covers the procedure followed in running a digestibility test, difficulties in conducting digestibility tests, results of the first four digestibility tests, and interpretation of the results. It was found that the protein digestibility of other diets was approximately 1½ percent greater than for the diet containing fish, but the latter was adequate for growth.

CALIFORNIA:

California Fish and Game, vol. 48, no. 1, January 1962, 86 pp., illus., printed, single copy 75 cents. Department of Fish and Game, 987 Jedsmit Dr., Sacramento 19, Calif. Includes, among others, the following articles: "The Names of Certain Marine Fishes of California," by Phil M. Roedel; "The Pismo Clam 1960," by John L. Baxter; "Age Determination of the Pacific Albacore of the California Coast," by Robert R. Bell; "Water Velocities Tolerated by Spawning

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Kokanee Salmon," by Glenn E. Delisle; and "Purse Seining for Pacific Albacore," by John A. Shaver.

CANADA:

Annual Report of the Department of Natural Resources, Province of Saskatchewan, for the Fiscal Year Ended March 31, 1961, 160 pp., illus., printed. Department of Natural Resources, Regina, Saskatchewan, Canada, March 31, 1961. A compilation of reports of the branches of the Department of Natural Resources, including a 20-page report of the Fisheries Branch. The section on fisheries covers activities in management, research, fish culture, and information on enforcement. Statistical data are also given on fish production and value.

Canadian Fisheries Reports, no. 1, 58 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada, September 1961. A new periodical published to disseminate specialized information of interest to the fishing industry, from the catching to the end product. Articles may deal with conservation, inspection, development, economics, and related subjects. This issue contains the following articles: "A Study of the Influence of Freezing and Frozen Storage on Bacterial Survival in Fish Fillets," by N. Neufeld and R. Garm; "The Effect of Freezing and Subsequent Frozen Storage on the Survival of Bacteria Found on Freshwater Fish Fillets," by G. R. Douglas and J. A. Clarke; "Abnormally Coloured Groundfish Fillets," by J. P. Hennessey; "Distinguishing Canned Brisling from Canned Sild Sardines," by J. H. Mann; "Some Observations Concerning Experimental Application of Objective Quality Tests to West Coast Fish," by H. L. A. Tarr; "Observations on Bacterial Counts and Conformance to C. G. S. B. Tolerances for Defects," by J. P. Hennessey and A. R. Johnston; and "Progress Report on Salt Codfish Block Project."

CANS:

"Mass Produced Aluminum Cans from Precoated Foil," article, Food Processing, vol. 21, no. 12, 1960, pp. 26-28, illus., printed. Food Processing, Putnam Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

CATFISH:

The Fresh-Water Catfishes of Texas and How to Know Them, by William H. Brown, Bulletin No. 39, 9 pp., illus., printed. Texas Game and Fish Commission, Austin, Texas, June 1961. Presents an accurate means for identifying the various catfish native to the inland waters of Texas. Of interest to both fishermen and students of fishery biology. Contains a key outlining the distinguishing features of each species of catfish and a detailed description of each including common and scientific names, physical characteristics, distribution, and methods of capture. Also includes a diagram showing the differing external structures of the various species.

CAVIAR:

"Factors Affecting Quality of Processed Caviar (Sturgeon Roe) on Storage," by Yu. I. Raninskaya, article, Chemical Abstracts, vol. 55, 97131, May 15, 1961.

CHILE:

Explotación Pesquera y Aprovechamiento de los Productos de la Pesca en Chile (Fishery Development and Utilization of Fishery Products in Chile),

Primer Congreso Chileno de Ingeniería Química, vol. III, 307 pp., printed in Spanish. Instituto de Ingenieros Químicos de Chile, Concepcion, Chile, August 1959. Contains articles by engineers, nutritionists, biologists, and others on Chile's fishery problem, fishery biology, fishery products in human nutrition, marine plants, fish meal for animal consumption, frozen fishery products, fishing ports and docks, fishing vessels, fishery economics in relation to processed fishery products, fishery statistics, commercial development of the fisheries, and fishery politics and legislation.

CLAMS:

Problems Involved in the Development of Clam Farms, by Harry J. Turner, Jr., Publication 4451, 12 pp., illus., printed. (Reprinted from The Smithsonian Report for 1960, pp. 465-472; also reprinted from Oceanus, vol. 7, no. 1, September 1960.) Smithsonian Institution, Washington 25, D. C., 1961. Discusses the history of the soft-shell clam fishery, efforts at conservation and development, stocking a clam farm, predators, settlement of clams, geological factors involved in clam settlement, and need for further study.

COD:

"The Expressible Fluid of Fish Fillets. X--Sodium and Potassium Content in Frozen and Iced Fish," by R. M. Love, and "XI--Ice Crystal Formation and Cell Damage in Cod Muscle Frozen Before Rigor Mortis," by R. M. Love and S. B. Haraldsson, articles, Journal of Science of Food and Agriculture, vol. 12, June 1961, pp. 439-449, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

COMMISSIONS:

Gulf States Marine Fisheries Commission Twelfth Annual Report 1960-1961 (to the Congress of the United States and to the Governors and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 42 pp., printed. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La. Outlines the Commission's activities for the period October 1960-October 1961, with a summary of some of the points of general interest in the Compact among the 5 Gulf States. Describes briefly the activities of each of those States during the period. Short discussions of U. S. Fish and Wildlife Service activities in navigation projects, flood control, hurricane protection projects, navigation permits, industrial fish explorations, gear research, scallop and clam explorations, exploratory snapper trawling, shrimp explorations, biological and technological laboratories, and the Gulf fishery statistical and Market News programs are included. Also contains a financial report of the Commission.

DEHYDRATION:

"Novyi Spособ Sushki" (New Drying Method), by A. I. Iuditskaia, V. I. Tresheva, and V. V. Kolchev, article, Tekhnologiya Rybnikh Produktov, vol. 60, 1959, pp. 94-97, printed in Russian. Trudy, Tekhnologiya Rybnikh Produktov, VNIRO Glavni-proekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

DOLPHINS:

"On the Species of Dolphins Found on the Coast of Northern Norway and in Adjacent Waters," by Age

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Jonsgard, article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 51, no. 1, January 1962, pp. 1-13, illus., printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

"Vocal Exchanges between Dolphins," by John C. Lilly and Alice M. Miller, article, *Science*, vol. 134, no. 3493, December 8, 1961, pp. 1873-1876, illus., printed, single copy 35 cents. *Science*, 1515 Massachusetts Ave., NW, Washington 5, D. C.

DRIED FISH:

"Experimental Preservation of Fish Dried by the Sublimation Method," by K. V. Martem'yanova, article, *Chemical Abstracts*, vol. 54, 19999a, October 10, 1960.

EXPLORATORY FISHING:

"Seefischei. Die Dritte Suchreise 1959, eine Winterreise nach Gronland" (Sea Fisheries. The Third 1959 Voyage in Search of New Grounds - a Winter Voyage to Greenland), by A. S. Meyer, article, *Hansa*, vol. 97, nos. 23/24, 1960, pp. 1212-1215, illus., printed in German. *Hansa*, C. Schroeder and Co., 10 Stubbenhuk, Hamburg 11, Germany.

FACTORYSHIP:

"Die Projectierung der Kaltetechnischen Einrichtung eines Fischfabriksschiffes" (Designing the Refrigerating Plant of a Fish Factoryship), by E. Zimmermann, article, *Schiffbautechnik*, vol. 10, 1960, pp. 379-389, illus., printed in German. *Schiffbautechnik*, C. Schroeder und Co., Stubbenhuk 10, Hamburg 11, Germany.

FAT CONTENT:

"Dynamics of the Fat Content of the Fish," by G. E. Shul'man (Kerch'), article, *Russian Review of Biology*, vol. 49, no. 2, 1960, pp. 209-222, printed. *Russian Review of Biology*, Oliver and Boyd Ltd., 38A Welbeck St., London W1, England.

FILLETING MACHINE:

"Cuts Problem Down to Size," by David N. Lewin, article, *Food Engineering*, vol. 33, August 1961, p. 36, printed. Describes a Swedish compact fish-filleting machine. Requires only two operators to feed raw fish into it, has a capacity of 150 fish (ranging in size from 1 to 15 fish per pound) per minute, and occupies 60 square feet of floor space. *Food Engineering*, Chilton Company, Chestnut and 56th Sts., Philadelphia 39, Pa.

FISH BEHAVIOR:

"An Experimental Study of Competition for Food in Fish," by Craig MacPhee, article, *Ecology*, vol. 42, no. 4, Autumn 1961, pp. 666-681, illus., printed. *Ecological Society of America*, Duke University Press, Box 6697, College Station, Durham, N.C.

FISH CULTURE:

"Utilization of Saline Mud Flats for Fish Culture - An Experiment in Marine Fish Farming," by P. R. S. Tampi, article, *Indian Journal of Fisheries*, vol. 7, no. 1, April 1960, pp. 137-146, illus., printed. *Indian Journal of Fisheries*, Ministry of Food and Agriculture, New Delhi, India.

FISH DETECTION:

"Ekkolodd Fiskesoking og Undervannsfotografering" (Fish Detection by Echo Sounder and Underwater

Photography), by G. Saetersdal, article, *Konkyljen*, vol. 5, no. 1, 1960, pp. 28-31, illus., printed in Norwegian with English summary. *Konkyljen*, Stord Marin Industry A. S., Bergen, Norway.

FISH FLOUR:

Studies of the Nutritional Value of Fish Flesh Products, by A. B. Morrison and others, Paper No. C/III (FAO International Conference on Fish in Nutrition, Washington, D. C., September 19-27, 1961), 11 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy.

FISHING EFFORT:

"The Relationship of Fishing Effort by Gill Nets to the Interval between Lifts," by W. A. Kennedy, article, *Journal of the Fisheries Research Board of Canada*, vol. 8, no. 4, October 1951, pp. 264-274, printed. *Fisheries Research Board of Canada*, West Block, Ottawa, Canada.

FISHING WITH LIGHTS:

"Use of Bunches of Lamps in Fishing for Sprats with Fish Pumps," by I. V. Nikonov, article, *Rybnoe Khoziaistvo*, vol. 35, 1959, pp. 42-47, printed in Russian. *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISH-LIVER OIL:

"Hydrocarbons in Pollack Liver Oil," by Isami Tsujino, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, February 1961, pp. 222-224, printed. *Hokkaido University*, Kameda-Machi, Hakodate, Japan.

FISH MEAL:

Fish and Fishery Products in Poultry Rations, by J. Baelum, Paper No. R/IV/5 (FAO International Conference on Fish in Nutrition, Washington, D. C., September 19-27, 1961), 14 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

Nutritional and Chemical Changes in the Lipid Fraction of Stored Antioxidant-Treated and Untreated Herring Meals, by B. E. March and others, *Circular No. 25*, 13 pp., illus., processed. *Fisheries Research Board of Canada*, Technological Station, Vancouver, B. C., Canada, December 1961.

"Production et Vente de Farine de Poisson" (Production and Sale of Fish Meal), by G. Meseck, article, *France Pêche*, vol. 6, no. 57, December 1961, pp. 23-25, illus., printed in French. *France Pêche*, Service Abonnement, Boite Postale 179, Lorient (Morbihan), France.

Quality of Fish Meal in Relation to Its Value as a Supplement to Corn-Soybean Meal Chick Diets, by H. M. Scott and others, Paper No. C/IV/4 (FAO International Conference on Fish in Nutrition, Washington, D. C., September 19-27, 1961), 3 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

FISH OIL:

"Chemical Properties of Oils in Gamma-Radiated Fish Meat and Products. Part I," by Takashi Kaneda, Hisae Sakai and Seinosuke Ishii, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 11, 1959, pp. 909-912, printed in Japanese with Eng-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

lish summary. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kai-gandori 6-chome, Tokyo, Japan.

"Separation of Fatty Acids from Oxidized Fish Oils," by Jack J. Bulloff, article, Chemical Abstracts, vol. 55, 11887d, June 12, 1961.

FRANCE:

Etudes Ecologiques et Biocénologiques dans la Baie du Brusc (Var), Généralités--But des Recherches (Ecological and Biocenotic Studies in the Bay of the Brusc (Var), General Aspects--Objectives of the Study), by Roger Molinier, Bulletin de L'Institut Océanographique, No. 1194, 8 pp., illus., printed in French with English summary. Musée Océanographique (Bulletin), Monaco-Ville (Principauté), January 26, 1961.

France Pêche, vol. 6, no. 56, November 1961, 158 pp., illus., printed in French. France Pêche, Tour Sud-Est, Rue de Guemene, Lorient (Morbihan), France. Contains articles on the principal fishing ports of France including Calais, Boulogne-sur-Mer, Dieppe, Fecamp, Honfleur, Port-en-Bessin, Cherbourg, Camaret, Douarnenez, Audierne, Saint-Guenole, Concarneau, Lorient, Etel, Quiberon, La Turballe, Le Croisic, Saint-Nazaire, Saint-Gilles Croix-de-Vie, Les Sables-d'Olonne, La Rochelle, Bordeaux, Arcachon, and Saint-Jean-de-Luz.

"La Marche du Poisson en France et Ses Problèmes" (The Fishery Products Market in France and Its Problems), by P. F. Louis, article, La Pêche Maritime, vol. 40, 1005, December 1961, pp. 883-886, illus., printed in French, single copy 22.50 NF (about US\$4.55). La Pêche Maritime, 190, Boulevard Haussmann, Paris 8^o, France.

FREEZE-DRYING:

"London Freeze-Dry Symposium," by Frank K. Lawler, articles, Part 1, Food Engineering, vol. 33, no. 12, December 1961, p. 37; Part 2, vol. 34, no. 1, January 1962, pp. 44-46, illus., printed, single copy \$1. Food Engineering, Chilton Company, Chestnut and 56th Sts., Philadelphia 39, Pa.

FROZEN FOOD:

"Frozen Food Handling," by D. G. Guadagni, article, Industrial Refrigeration, October 1960, pp. 10-14, printed. Industrial Refrigeration, Nickerson and Collins Co., 433 N. Waller Ave., Chicago, Ill.

FROZEN STORAGE:

"Studies of Frozen Fish. II--Some Chemical Changes Occurring During Frozen Storage," by P. L. Sawant and N. G. Magar, article, Food Technology, vol. 15, August 1961, pp. 347-350, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

GHANA:

Report of the Fisheries Division, Ministry of Food and Agriculture, 1959, 59 pp., illus., printed, 7s. 6d. (about US\$1.05). Ministry of Information, Accra, Ghana, 1961. Government Printing Department, (Publications Branch), Accra, Ghana, 1961. Covers operations and developments in Ghana's sea fisheries, tuna survey, fresh-water fishery, fish-pond experiments, FAO technical aid, fisheries statistics, marketing, loan program, training, activities,

research, and processing. Includes statistical tables showing motor fishing vessels and canoes, marine fish production, trawler catch analyses, line-fishing catch analyses, sardinella catch, fresh-water fish catch, and fishery products imports.

GROWTH STUDIES:

"Aged in the Scale," by Phil A. Dotson, article, Utah Fish and Game, vol. 18, no. 1, January 1962, pp. 6-7, illus., printed. Utah State Department of Fish and Game, 1596 W. North Temple, Salt Lake City 16, Utah. A careful study of the bony structures of fish which include scales, operculum or gill cover bones, spiny rays, vertebrae and otoliths, sometimes called ear stones, reveals that each bears growth rings similar to those of trees. The scales of fish are most commonly used in age and growth studies. Not only are the scales more reliable, but they require very little preparation other than mounting on a microscope slide.

HEMATOLOGY:

"Occurrence of Heparin in the Blood of Fish and Its Prevention of the Clotting of Fish Plasma," by S. Z. Qasim and R. Hasan, article, Nature, vol. 189, 1961, pp. 764-765, printed. Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

HERRING:

"Chemical Studies on the Herring (*Clupea harengus*). V--The Effect of Heat Processing on the Extractable Nitrogen Fraction," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 12, June 1961, pp. 475-483, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

The Environment of a Herring Fishery, by John H. Steele, Marine Research No. 5, 19 pp., illus., printed, 7s. 6d. (about US\$1.05). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1961.

Histological Changes in the Gonad Associated with the Reproductive Cycle of the Herring (CLUPEA HARENGUS L.), by A. B. Bowers and F. G. T. Holliday, Marine Research No. 5, 16 pp., illus., printed, 9s. (about US\$1.26). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1961.

The Multitudinous Pacific Herring, by Donald Outram, Circular No. 63, 15 pp., illus., processed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, December 1961. Discusses the historical background of the herring fishery, the British Columbia herring fishery, utilization of herring for production of meal and oil, physical characteristics, spawning runs, spawning habits, larvae, juveniles, research and regulations, herring as food for other fish, the herring as a food source.

"Russisches Heringsmuttersschiff (Russian Herring Fishing Mothership), article, Hansa, vol. 97, nos. 16/17, 1960, p. 784, illus., printed in German. Hansa, C. Schroedter and Co., 10 Stubbenhuk, Hamburg 11, Germany.

ICE MACHINE:

"Grasse Ontwikkelt een Volautomatisch Werkende Staafinstallatie" (Completely Automatic Plant for the Manufacture of Tube Ice), article, Mededelingen, Nederlandse Vereniging voor Koeltechniek, vol. 52, no. 1, 1959, pp. 25-28, illus., printed in Dutch. Neder-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

landse Vereniging voor Koeltechniek, Pasteurstraat 1, Leiden, Netherlands.

"Novyi 1'dogenerator Dlia Rybolovnykh Sudov" (A New Ice-Maker for Trawlers), by G. S. Konokotin and P. A. Kuraptsev, article, *Rybnoe Khoziaistvo*, vol. 35, no. 11, 1959, pp. 50-55, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Snegoval'nyi Agregat VNIKhI" (The VNIKhI Snow Ice Machine), by V. Bobkov, article, *Kholdil'naia Tekhnika*, vol. 37, no. 1, 1960, pp. 14-17, illus., printed in Russian with English summary. Kholdil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

ICHTHYOLOGY:

"The Episcopal Fish," by Bernard L. Gordon, article, *Frontiers*, vol. 26, no. 1, October 1961, pp. 6-9, illus., printed, single copy 50 cents. *Frontiers*, 19th and The Parkway, Philadelphia 3, Pa. An account of the life and works of Guillaume Rondelet, 16th Century French physician and ichthyologist, who published two volumes on fish. His illustration of the sea urchin is believed to be the earliest recorded figure of a dissected invertebrate.

INDIA:

"Notes on the Tuna and Frigate Mackerel from Ratnagiri," by M. R. Ranade, article, *Journal of the Bombay Natural History Society*, vol. 53, no. 2, August 1961, pp. 351-354, illus., printed. *Journal of the Bombay Natural History Society*, 91 Walkeshwar Rd., Bombay 6, India.

INDUSTRIAL PRODUCTS:

"Die Beeinflussung von Zellen und Zellverbänden durch Elektrostatische Impulse" (Influencing Cells and Cell Walls by Electrostatic Impulses), by Engineer Doevenspeck, article, *Die Fleischwirtschaft*, vol. 13, no. 12, December 1961, pp. 985-988, printed in German, French, and English, with a short summary also in Italian and Spanish. *Die Fleischwirtschaft*, Verlagshaus Sponholz, Krosser Hasenpfad 42-48, Frankfurt am Main, Germany. A paper read at the 7th Conference of the Food Hygiene Section of the German Veterinary Association, Freudenstadt, October 3-5, 1961. Describes a new process for the reduction of fish to obtain meal, oil, and solubles. Instead of the conventional cooking process electrostatic impulses are used. These impulses are directed by discharging high potential condensers through the material being treated by means of carbon electrodes. Neutralization of the protein complexes which disrupt the processing is sufficient to permit the individual phases--fats, hydration water, and solid material--to be obtained. Unpleasant odors are avoided with this process. The products contain all essential factors such as fatty acids, vitamins, antioxidants, etc. and when used for animal experiments show a high feed value and great digestibility. Micro-organisms are activated or inactivated as desired by electrostatic impulses.

INTERNATIONAL COMMISSIONS:

International Commission for the Northwest Atlantic Fisheries, Report of the Meeting of the Environmental Working Party, Aberdeen, 14-20 March, 1961, 37 pp., processed. (Reprinted from 1961 Red

Book, Part I, 3, pp. 61-97.) International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1961. Presents the proceedings, conclusions, and a list of the papers prepared for the Meeting of the Environmental Working Party. It was proposed that a symposium on the influence of the environment on the distribution and abundance of the principal groundfish in the ICNAF Area be held in 1962 or 1963. The topics covered will include effect of physical environmental conditions on the distribution of adult fish; effect of the biological environment (including parasites) on the distribution of adult fish; effect of the environment on growth, survival, and age and size at first maturity; and effect of the environment on pelagic and early demersal phases of groundfish. Also covered will be effect of long-term trends; physiological reactions to changes in the environment; forecasting environmental conditions; and effect of the environment on the process of fishing. Review lectures will cover the hydrography of the area and the effects of the environment on the Pacific sardine, the herring, and the tuna. Research projects were planned to cover regional problems in the ICNAF subareas and general topics concerning environmental tolerance, water movements, eggs and larvae, ocean perch, and other objectives such as tagging experiments.

The Permanent Commission--Report by the President on the Ninth Meeting, 32 pp., processed in English and portions in French. Office of the Permanent Commission, International Fisheries Convention of 1946, East Block, Whitehall Pl., London SW1, England, 1961. Report of the Ninth Meeting of the Permanent Commission, held at Copenhagen, May 9-12, 1961. Records, among other items, discussions on the report by the Liaison Committee of the International Council for the Exploration of the Sea, report by the Committee on the Whiting Fisheries, discussions of regulation of mesh sizes, and agreement on mesh size in the northern part of the Convention area. Also includes the agenda of the ninth meeting, a list of the delegates and observers, and financial reports.

INTERNATIONAL TRADE FAIRS:

America's Showcase Abroad, 12 pp., illus., printed. Office of International Trade Fairs, U. S. Department of Commerce, Washington 25, D. C., 1961. Discusses United States participation in international trade fairs, facilities and services offered, how to join the Trade Fairs Program, display space, all-American exhibitions, how taking part means an opportunity for public service, requirements of exhibitors, benefits from participation, and animated displays.

IRRADIATION PRESERVATION:

"A Compact Cobalt-60 Source for the Experimental Irradiation of Food Samples," by B. Coleby, article, *Chemistry and Industry*, no. 45, 1960, pp. 1375-1378, illus., printed. Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Processing by Irradiation. II--Application to Food Preservation," by F. L. Ley and J. R. Hickman, article, *Research*, vol. 13, no. 5, 1960, pp. 193-197, printed. Research, Butterworths Scientific Publications, 88 Kingsway, London WC2, England.

JAPAN:

Annual Report of Catch Statistics on Fishery and Aquaculture, 1960, Agriculture Forestry and Fishery

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Statistics Bulletin 36-43, 445 pp., printed in Japanese and English. Statistics and Survey Division, Ministry of Agriculture and Forestry, Tokyo, Japan, November 1961. Contains statistical data on the 1960 production of marine fisheries--whaling, pelagic fisheries on the high seas, and domestic marine fisheries; culture in shallow seas; inland water fisheries; and culture in inland waters. Also presents data on processing and average market prices of fishery commodities.

Bulletin of the Tokai Regional Fisheries Research Laboratory, no. 31, July 1961, 322 pp., illus., printed in Japanese with English summaries. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Includes, among others, the following articles: "Statistical Investigations on Fluctuations in Catch of the Yellowtail, *Seriola quinqueradiata*, and Related Oceanographic Conditions," by S. Kurita; "Preliminary Report on Age Determination by Scales and Growth of Sardine in the Gulf of Suez," by S. Naseef; "Fishery Biology of the Japanese Anchovy, *Engraulis japonica* (Houttuyn)," by S. Hayashi; "On the Spawning of Abalone in the Vicinity of Ibaragi Prefecture," by T. Ino and K. Harada; "Systematic Studies on Toxic Components in Industrial Wastes with Reference to the Tolerance of Aquatic Lives. I--Gas Liquor from City Gas Works," by K. Tabata and R. Fukai; "Studies on Trawl Net. V--A Measuring Device and a Formula to Obtain the Opening Breadth of Wing Nets; VI--Comparative Efficiency Between Two Types of the Otter Board with Different Ratios as to the Length and the Height," by S. Takayama and T. Koyama; "The Amounts of Chemical Constituents of Eyed Eggs of Rainbow Trout from Various Sources," by S. Murayama and M. Yanase; and "Study on Fish Solubles. I--Nutritive Elements of Fish Solubles Produced in Japan," by H. Higashi, S. Murayama, and M. Yanase.

Statistic Tables of Fishing Vessels (as of the End of 1960), General Report No. 13, 247 pp., illus., printed in Japanese and English. Japanese Fisheries Agency, Tokyo, Japan. An annual report containing statistical data in detail on the various types of Japanese fishing craft, both powered and nonpowered, as obtained by a fishery registration system.

MARINE ALGAE:

Studies on the Free Amino Acid Contents of Some Marine Algae from Bombay, by E. J. Lewis and E. A. Gonzales, article, Journal of the University of Bombay, Biological Sciences Including Medicine, New Series, vol. 28, no. 46, part 3, 1959, pp. 1-5, printed. University of Bombay, Fort Bombay, India.

MELANISM:

Sur la Pigmentation Melanique des Poissons Profonds et la Teneur de Leur Hypophyse en Principe Melanophorique (Melanoid Pigmentation of Deep-Sea Fishes and the Melanophore Principle of Their Pituitary), by Rene Motais, Bulletin de L'Institut Oceanographique, No. 1198, 28 pp., illus., printed in French with English abstract, 3.50 NF (77 U. S. cents). Musee Oceanographique (Bulletin), Monaco-Ville (Principaute), February 28, 1961.

NETS:

"Preliminary Investigations on Sun-Hemp Twine as Fishing Net Material," by H. Miyamoto and A. T. Shariff, article, Indian Journal of Fisheries, vol. 6, 1959, pp. 389-398, printed. Indian Journal of Fisheries, Ministry of Food and Agriculture, New Delhi, India.

"Report on the Comparative Trials with a Modified Seine Net and a Standard Haddock Net," article, World Fishing, vol. 9, no. 11, 1960, p. 41, printed. World Fishing, John Trundell Ltd., St. Richards House, Eversholt St., London NW1, England.

"Synthetisches Netzmaterial für Feine Kiemennetze" (Synthetic Net Materials for Fine Gillnets), by G. Klust, article, Schweizerische Fischerei-Zeitung, vol. 68, no. 2, 1960, pp. 38-40, illus., printed in German. Schweizerischer Fischer-Verband, Zurich, Switzerland.

NORWAY:

"Rapport fra Sildeundersøkelsen ved Island 1961," (Report on Herring Investigation off Iceland, 1961), by O. J. Ostved, article, Fiskets Gang, vol. 47, no. 50, December 14, 1961, pp. 771-773, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Rådstuplass 10, Bergen, Norway.

OCEAN PERCH:

ICES/ICNAF Redfish Symposium, Special Publication No. 3, 311 pp., illus., printed, C\$11.25. International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1961. Contains papers prepared in connection with the Redfish Symposium held at Copenhagen, October 12-16, 1959. The papers are grouped under the following subject headings: systematics and natural marks, redfish distribution, larval studies and larval distribution, sex and maturity, and age and growth.

OCEANOGRAPHY:

Aspects des Recherches Oceanographiques dans le Pacifique Sud, Quelques Resultats Biologiques (Observations on Oceanographic Research in the South Pacific, Some Biological Findings), by Michel Legand, 52 pp., illus., printed in French. (Reprinted from Cahiers du Pacifique, no. 3, June 1961.) Institut Français d'Océanie, Boite Postale No. 4, Noumea, New Caledonia.

The Design of Modern Oceanographic Research Vessels, by L. Rosenblatt, 53 pp., illus., printed. Society of Naval Architects and Marine Engineers, 29 W. 39th St., New York 18, N. Y. Paper read at the Spring Meeting of the Society of Naval Architects and Marine Engineers, Washington, D. C., May 26-28, 1960.

An Oceanographic Research Submarine of Aluminum for Operation to 15,000 Ft., by E. Wenk, Jr. and others, 19 pp., printed. Royal Institute of Naval Architects, 10 Upper Belgrave St., London SW1, England. Paper read at the Meeting of Royal Institute of Naval Architects, March 23, 1960.

Travaux du Centre de Recherches et d'Etudes Oceanographiques (Work of the Center for Oceanographic

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Research and Studies), New Series, vol. 4, nos. 1, 2, 3, September 1961, 116 pp., illus., printed in French. Centre de Recherches et D'Etudes Oceanographiques, 1, Quai Branly, Paris (7^e), France.

OCTOPUS:

"Lipids from the Liver of *Octopus dofleini*. III--On the Unsaponifiable Matter," by Mutsuo Hatano, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 11, February 1961, pp. 218-221, printed. Hokkaido University, Kameda-Machi, Hakodate, Japan.

OYSTERS:

"Total Solids in Oysters by Force-Draft Oven," by John T. McElroy, article, *Journal of the Association of Official Agricultural Chemists*, vol. 44, May 1961, pp. 276-277, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

PARASITES:

Parasitology of Fishes, by V. A. Dogiel, G. K. Petrushevski, and Yu. I. Polyanski, 384 pp., illus., printed, translated from Russian, \$12. Oliver & Boyd, Tweeddale Court, High St., Edinburgh 1, Scotland. Comprehensive review of wide range of research on the problems of fish parasitology, both marine and fresh-water. Includes discussion of zoogeography of the fish parasite fauna.

PEARL ESSENCE:

"On Some Experiments for Preparing Pearl Essence," by T. Ueda, article, *Journal of the Shimonoseki College of Fisheries*, vol. 9, no. 3, 1960, pp. 377-382, printed in Japanese with English summary. Shimonoseki College of Fisheries, Jamaguchi Prefecture, Yoshimi, Shimonoseki, Japan.

PEARLS:

Pearls of Japan, 1961, edited by Saburo Motojima, 27 pp., illus., printed. Japan Pearl Exporters' Association, Pearl Center, 7, Kyobashi 3-chome, Chuo-ku, Tokyo, Japan. An attractively illustrated booklet covering pearls and women divers, pearls and fashion, necklaces, the sea and oysters that create pearls, and pearls for export. Also includes a list of pearl exporters.

PENNSYLVANIA:

"Fish Commission Budget for 1962-63," by Albert M. Day, article, *Pennsylvania Angler*, vol. 31, no. 2, February 1962, pp. 6-8, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Discusses anticipated income and expenditures for executive and general administration, propagation, research, law enforcement, lands and water management, and engineering and development in the 1962-63 budget for the Pennsylvania Fish Commission.

Pennsylvania Fishes, by Albert S. Hazzard, 24 pp., illus., printed, 25 cents. (Reprinted from *Pennsylvania Angler*, April 1956-February 1957.) Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Contains drawings and brief descriptions of 51 fish found in Pennsylvania waters. Describes for each fish its range, characteristics, habits, food, and lures to be used. Should be helpful

to fishermen and others interested in knowing something about most of the common fish of Pennsylvania and the lures and methods used in taking them. One reason for the large number of fish is that Pennsylvania lies within three major watersheds. There are 33 major families of fish found within its boundaries. Some have been introduced successfully, such as the carp and brown trout. Others have been introduced with no permanent success, such as the grayling, Atlantic salmon, and at least one species of the Pacific salmon. Important transplants to certain waters within the State may also be noted, for example the smallmouth bass and the walleye or yellow pike were not native to the Delaware or to the Susquehanna rivers, although originally found in the Ohio and in St. Lawrence drainages.

PERU:

Desarrollo de la Pesca Peruana en 1961 Comparada con el Bienio 1959/60 (Development of the Peruvian Fishery in 1961 Compared with the Biennium 1959/60), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica 16, 21 pp., illus., printed in Spanish. Servicio de Pesquero, Ministerio de Agricultura, Lima, Peru.

PLANKTON:

Plankton Energetics of Raritan Bay, by Bernard Paten, 19 pp., illus., printed. (Reprinted from *Limnology and Oceanography*, vol. 6, no. 4, October 1961, pp. 369-387.) Woods Hole Oceanographic Institution, Woods Hole, Mass.

PLANT EQUIPMENT:

"Air Pump Handles Jam, Live Fish," article, *Food in Canada*, vol. 20, no. 9, 1960, p. 39, illus., printed. Food in Canada, MacLean-Hunter Publishing Co., Ltd., 481 University Ave., Toronto 2, Canada.

PRESERVATION:

"Experiments on Preservation with a New Ice Containing Glycol Diformalate and Sorbic Acid," by Socrates Kaloyereas, R. M. Crown, and C. S. McCleskey, article, *Food Technology*, vol. 15, August 1961, pp. 361-364, printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

PROTEIN:

"Comparative Study on Coagulability of Fish Muscle Protein," by Usio Simidu and Wataru Simidu, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, November 1960, pp. 1099-1106, printed in Japanese. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Species Identification by Starch Gel Zone Electrophoresis of Protein Extracts. I--Fish," by R. R. Thompson, article, *Journal of the Association of Official Agricultural Chemists*, vol. 43, 1960, pp. 763-764, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

QUALITY:

"Chemical Methods for the Determination of the Freshness of Fish," by D. Somaatmadja, J. J. Powers, and D. E. Pratt, article, *Journal of Milk and Food Technology*, vol. 24, no. 1, 1961, pp. 2-6, printed. Inter-



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

national Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

"A Comparison of Some Taste-Test Methods," by N. T. Gridgemen, article, *Journal of Food Science*, vol. 26, March-April 1961, pp. 171-177, printed, Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

"Fishy Flavor in Dairy Products. I--General Studies on Fishy Butterfat," by E. G. Pont and others, article, *Chemical Abstracts*, vol. 55, 8689b, May 1, 1961.

RADIATION PRESERVATION:

"Progress in the USAEC Radiation Pasteurized Foods Program," by Joseph E. Machurek, article, *Food Irradiation Quarterly Newsletter*, vol. 1, April-June 1961, pp. A3-A6, printed, O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave. NW., Washington 6, D. C.

REFRIGERATION:

"Refrigeration in Soviet Fishing Industry," by E. G. Pavlov, article, *Kholodil'nika Tekhnika*, no. 6, 1961, pp. 4-7, printed in Russian. *Kholodil'nika Tekhnika*, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

RESEARCH VESSEL:

"Fishery Research Vessel Jens Vaever," article, *Shipbuilding and Shipping Record*, vol. 96, no. 19, 1960, pp. 604-605, illus., printed, Shipbuilding and Shipping Record, Tothill Press Ltd., 33 Tothill Rd., Westminster, London SW1, England.

RHODE ISLAND:

"List of Marine and Brackish Water Fish of Rhode Island," by Bernard L. Gordon, article, *The Narragansett Naturalist*, vol. 4, no. 2, Summer 1961, pp. 84-87, illus., printed, Audubon Society of Rhode Island, 40 Bowen St., Providence 3, Rhode Island.

RHODESIA:

The Fishes of Northern Rhodesia, by P. B. N. Jackson, 153 pp., printed, 7s. 6d. (about US\$1.05). The Government Printer, P. O. Box 136, Lusaka, Northern Rhodesia, September 1961. Discusses fish systematics in Northern Rhodesia, the Northern Rhodesian zoogeographical region, and nomenclature. Contains a key to all indigenous species of fish, including families, and genera. Most of the book is devoted to descriptions of 155 species of fish native to Northern Rhodesia.

SALMON:

Contributions to the Biology of the Salmonidae in Greenland I-IV, by Jorgen Nielsen, 76 pp., illus., printed. (Reprinted from *Meddelelser om Gronland*, bd. 159, no. 8.) Bianco Lunos Bogtrykkeri A/S, Copenhagen, Denmark, 1961.

SALT FISH:

A Review of the Salt Fish Industry of Kerala (South India), by S. N. Rao and A. G. Vasavan, Occasional Paper 61/5, 6 pp., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1961.

SALTING:

"Izuchenie Processa Elektroposola Ryby" (The Study on Electric Salt Curing of Fish), V. N. Podsevalov, article, *Trudy, Tekhnologia Rybnikh Produktov*, vol. 60, 1959, pp. 98-107, illus., printed in Russian. *Trudy, Tekhnologia Rybnikh Produktov*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"A Simple Method of Regenerating the Saline Solution Used in Brine Salting," by Noriyuki Enomoto, Tokio Izumi, and Yukio Tomiyasu, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, March 1960, pp. 343-348, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

SANITATION:

"Hygienic Considerations in Food Plant Design," by W. B. Johnson, article, *Chemistry and Industry*, no. 39, 1960, pp. 1203-1206, printed. Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

Manual of Recommended Practice for Sanitary Control of the Shellfish Industry, Part I: Sanitation of Shellfish Growing Areas, Publication No. 33, 39 pp., 45 cents, 1959; *Part II: Sanitation of the Harvesting and Processing of Shellfish*, 29 pp., printed, 35 cents, 1957. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. The first part concerns sanitation of shellfish growing areas and covers general administrative procedures, laboratory procedures, growing area survey and classification, preparation of shellfish for marketing, and control of harvesting from closed areas. The appendices include bacteriological criteria of shellfish and shellfish waters and inspection of certified shellfish shippers. The second part discusses sanitation of the harvesting and processing of shellfish and presents information on harvesting and handling shell stock, shucking and packing shellfish, packing and shipping shell stock, repacking of shellfish, and reshippers.

SARDINES:

"Evolution de la Peche a la Sardine sur les Cotes Francaises de la Mediterranee" (Evolution of the Sardine Fishery on the French Coasts of the Mediterranean), by Cl. Maurin and S. di Meglio, article, *France Peche*, vol. 6, no. 57, December 1961, pp. 27-30, illus., printed in French. France Peche, Service Abonnement, Boite Postale 179, Lorient (Morbihan), France.

"Izyskanie Optimal'nykh Rezhimov Prigotovleniia Konservov 'Atlanticheskii Sardiny v Masle'" (Optimum Conditions for Production of Canned Fish "Atlantic Sardine in Oil"), by A. L. Petelina and S. A. Artiukhova, article, *Rybnoe Khoziaistvo*, vol. 36, no. 1, 1960, pp. 57-61, illus., printed in Russian. *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

SAURY:

"Amino Acids in Meat Extracts of Pacific Saury," by Shigeru Umemoto, article, Chemical Abstracts, vol. 55, 8690d, May 1, 1961.

SCOTLAND:

Scottish Fisheries Bulletin, no. 16, December 1961, 18 pp., illus., printed. Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland. Includes, among others, these articles: "Camera Aids Research," by R. E. Craig and R. Priestly; "The State of the North Sea Haddock Stock and Immediate Prospects for the Fishery," by Rodney Jones; "A Note on Recent Whiting Landings from the North Sea," by Ray Gambell; "I.C.N.A.F. Mesh Regulations," by C. E. Lucas; "The Catching and Marketing of Eels," by W. M. Shearer; and "Spotlight on the Salmon Bagnet," by W. M. Shearer and R. G. Lawrie.

SEAPORT:

United States Seaports, Alaska, Pacific Coast, and Hawaii, Port Series, Part 1, 176 pp., illus., processed, \$1. Maritime Administration, U. S. Department of Commerce, Washington, D. C., June 1961. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents data on port administration; Federal functions and services; terminal services, rates, and charges; labor contracts, rules, benefits, wage rates, and related data; foreign and domestic trade; port development; policy and legal actions taken by the government affecting the port industry.

SEA URCHIN:

"The Edible Sea Urchin, *Tripteneustes esculentus*, Leske in Barbados," by J. B. Lewis, article, West Indies Fisheries Bulletin, no. 5, September/October 1961, pp. 1-3, processed, 17 B.W.I. cents (about 10 U. S. cents). The Federal Fisheries Adviser, Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad. Discusses the commercially important sea urchin, its occurrence, breeding, growth, reaction to light, and feeding habits.

SEAWEED:

"Chemical Studies on Volatile Constituents of Seaweed. XVI--Their Phylogenetic and Biochemical Significance," by Teruhisa Katayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, January 1961, pp. 75-84, printed in Japanese. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Feeds from Seaweed or Mosses," by Georges E. A. Delarche, article, Chemical Abstracts, 7926b, vol. 54, April 25, 1960.

SEAWEED MEAL:

"Seaweed Meal for Human Consumption," by Algea Produktor A/S, article, Chemical Abstracts, vol. 55, 17949b, September 4, 1961.

SERRANIDS:

Materials for a Revision of SERRANUS and Related Fish Genera, by C. Richard Robins and Walter A. Starck, II, 56 pp., illus., printed. (Reprinted from Proceedings of the Academy of Natural Sciences of Philadelphia, vol. 113, no. 11, December 29, 1961,

pp. 259-314). Academy of Natural Sciences of Philadelphia, 19th St. and the Parkway, Philadelphia 3, Pa.

SMALL BUSINESS MANAGEMENT:

Are You Using Your Space Effectively?, by Edward L. Anthony, Technical Aids for Small Manufacturers No. 77, 4 pp., processed. Small Business Administration, Washington 25, D. C., November-December 1961. Increased profits, less confusion, and better morale can result from using available space more effectively. Many small plants have benefited from rearrangement. This leaflet shows some practical ways of looking at the problem of space utilization. The use of office space also deserves attention. Worthwhile rearrangements can often be made with the knowledge of a few basic layout principles.

Managing Women Employees in Small Business, by Eleanor Casebier, Small Marketers Aids No. 75, 4 pp., processed. Small Business Administration, Washington 25, D. C., January 1962. A leaflet offering suggestions for managing women employees in small business. Stress is laid on the fact that women want democratic leadership. Practices that help to promote efficiency are discussed with suggestions that small firm owner-managers can use when examining their own policies and procedures. There is also a list of 22 suggestions a manager can use to encourage women employees to work efficiently.

SMALL BUSINESS ADMINISTRATION:

U. S. Government Purchasing, Specifications and Sales Directory (A Guide for Selling or Buying in the Government Market), 124 pp., printed, 60 cents. Office of Procurement and Technical Assistance, Small Business Administration, Washington, D. C., July 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Provides information on selling to the Government and to Government contractors; lists products and services bought by the major military purchasing offices and indicates, by means of code numbers following the products or services, the purchasing offices that buy them; and discusses local purchasing by military installations and gives a State-by-State listing of installations that are possible sources of business for small concerns. Also lists products and services purchased by the major Federal civilian agency purchasing offices and indicates, again by means of code numbers following the products and services, the purchasing offices that buy them; provides a guide to Government specifications--what they are, how they are used, and where they may be obtained or reviewed by prospective bidders.

SOUTH CAROLINA:

Annual Report, 1960-1961, Contribution No. 35, 9 pp., illustrated, printed. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1960-June 30, 1961.) Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1962. A detailed description of the activities of Bears Bluff Laboratories for the period under review, covering the study of oysters, shrimp, blue crabs, finfish, and pond cultivation.

SPINY LOBSTERS:

"Proteccion de la Langosta" (Protection of the Spiny Lobster), by L. Faure, article, Puntal, vol. 8, no.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

93, December 1961, pp. 4-6, illus., printed in Spanish. Puntal, 21 San Fernando, Alicante, Spain.

Segunda Pesca Exploratoria y Datos Biologicos de la Langosta (PANULIRUS ARGUS) en Cuba (Second Exploratory Fisheries Expedition and Biological Data on the Spiny Lobster (*Panulirus argus*) in Cuba), by R. J. Buesa Mas, Contribution No. 12, 69 pp., illus., printed in Spanish. Centro de Investigaciones Pesqueras del Departamento de Pesca del Instituto Nacional de Reforma Agraria, Havana, Cuba, May 1961.

"Sobre a Biologia e a Pesca das Lagostas em Pernambuco (Brasil)" (On the Biology of and Fishery for Spiny Lobsters in Pernambuco, Brazil), by Melquiades Pinto Paiva, article, *Boletim da Pesca*, vol. 13, no. 73, December 1961, pp. 11-21, illus., printed in Portuguese with English summary. *Boletim de Pesca*, R. S. Bento, 644, 40 -Esq., Lisbon, Portugal.

SPRATS:

"Sardiny iz Kaspijskoj Kilki" (Sardine-Like Packs with Sprats from the Caspian Sea), by M. V. Kalantarova, M. V. Maksimova, and J. K. Rogova, article, *Trudy, Tekhnologia Rybnikh Produktov*, vol. 60, 1959, pp. 81-93, illus., printed in Russian. *Trudy, Tekhnologia Rybnikh Produktov*, VNIRO, Vsesoiuzny Nauchno-Issledovatel'ski Institut, Moscow, U.S.S.R.

SQUID:

"Chemical Composition of Ikashiokara, Salted Guts and Meat of Squid," by Hiroshi Takeya and Yukio Okuda, article, *Chemical Abstracts*, vol. 55, 7694a, April 17, 1961.

STORAGE:

"Storage of Dehydrated Cod. I," by N. A. Matheson, article, *Food Processing and Packaging*, vol. 30, no. 354, 1961, pp. 87-91, 98; "Storage of Dehydrated Cod. II," no. 355, 1961, pp. 123-127, illus., printed. *Food Processing and Packaging*, Tothill Press Ltd., 33 Tothill St., Westminster, London SW1, England.

STRIPED BASS:

"Further Returns of Striped Bass, *Roccus saxatilis*, Tagged from Deep Water During Winter in Chesapeake Bay, Maryland," by Romeo J. Mansueti and George J. Murphy, article, *Chesapeake Science*, vol. 2, nos. 3-4, September-December 1961, pp. 209-212, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

SUBMARINES FOR FISHERY RESEARCH:

"Exploring Under Sea by Towvane," article, *Fisheries Newsletter*, vol. 20, August 1961, p. 15, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia. Describes a new device for underwater observation which can be operated by one who is not a diver. The towvane is a heavily-constructed pressure-tight steel vessel which can be towed under water, dive toward the bottom, and then level off along the sea bottom. The towvane has no power unit, buoyancy tanks, or batteries. No special skill is needed to operate the towvane, which is itself buoyant and must be moving in order to submerge. Diving in

the towvane is said to be a safe operation because of the slow towing speed, heavy construction of the towvane, and the constant attention from the people in the boat that are towing the device. If it should become necessary, however, the diver can get out by himself. To do this he would commence breathing from his emergency aqualung, flood the towvane (by opening a gate valve) to equalize pressure, and then open a hatch and swim to the surface.

SUNFISH:

Hybridization Between Three Species of Sunfish (LEPOMIS), by William F. Childers and George W. Bennett, Biological Notes No. 46, 12 pp., illus., printed. Natural History Survey Division, Department of Registration and Education, Urbana, Ill., November 1961

TAIWAN:

Taiwan Fisheries Yearbook 1960 Edition, 185 pp., illus., printed in Chinese and English. Department of Agriculture and Forestry, Provincial Government of Taiwan, Taipei, Taiwan, August 1960. Contains statistical tables showing fishermen's organizations and membership, fishermen, status of fishing vessels, status of ice making and cold storage industries, fisheries production, and quantity of supply and sale of fishery products and their average value at principal fish markets. Also includes data on processed marine products, fish culture area, production of fish fries, number of casualties of fishermen, losses and damage to fishing vessels and gear, fishing activity at principal fishing harbors by type of craft, foreign trade in fishery products, and related information. Most data are for 1959.

TARIFFS:

Forty-Fifth Annual Report of the United States Tariff Commission (Fiscal Year Ended June 30, 1961), House Document No. 276, 82 pp., printed. United States Tariff Commission, Washington 25, D. C., 1962. Includes, among others, a section which discusses the investigation conducted on the domestic shrimp industry.

TERRITORIAL WATERS:

"La Mer Territoriale et les Zones de Peche Reserve" (Territorial Waters and the Restricted Fishery Zones), by R. Lagarde, article, *La Peche Maritime*, vol. 40, no. 1005, December 1961, pp. 875-882, illus., printed in French, single copy 22.50 NF (about US\$4.55). *La Peche Maritime*, 190, Boulevard Haussmann, Paris 80, France.

TRADE LISTS:

The Bureau of International Business Operations, U.S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 a copy.

Canneries and Frozen Foods--Producers and Exporters--Algeria, 6 pp. (December 1961). Lists the names and addresses and types of products handled by each firm. Includes fish canneries and exporters.

Canneries and Frozen Foods--Producers and Exporters--Morocco, 6 pp. (December 1961). Lists the names and addresses, size of firms, and types of

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products handled by each firm. Includes fish canneries, freezers, and exporters.

TRAWLER-FREEZER:

"Pererabotka Ulovov Sardiny i Drugikh Ryb na BMRT v Uslovnikh Tropikov (The Processing of Sardines and other Fish on Board BMRT, a Large Size Trawler-Freezer, in Tropical Conditions)," by Iu. A. Zorzhova, article, Rybnoe Khoziaistvo, vol. 36, no. 4, 1960, pp. 64-68, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta pri Gosplanie SSSR, Moscow, U.S.S.R.

TRAWLERS:

"A 151-Ft. Norwegian-Built Stern Trawler," article, Motor Ship, vol. 41, no. 484, 1960, pp. 374-375, illus., printed. Motor Ship, Temple Press Ltd., Bowling Green Lane, London EC4, England.

TRAWLING:

"Novvie Tralovyye Deski 'Akula-2'" (New Otter Boards 'Akula-2'), by E. Iu. Ianson and S. A. Minovich, article, Rybnoe Khoziaistvo, vol. 36, no. 4, 1960, pp. 25-33, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta pri Gosplanie SSSR, Moscow, U.S.S.R.

"Premiers Resultats des Essais de Modeles de Chaluts" (First Test Results with Trawl Models), by C. Nedelec, article, Science et Pêche, no. 92, April 1961, 5 pp., illus., printed in French. Institut Scientifique et Technique des Pêches Maritimes, 59 Ave. Raymond-Poincaré, Paris XVI, France.

Sobre el Encogimiento de las Mallas de Canamo del Cope de las Redes de Arrastre (On the Shrinkage of Hemp Meshes in the Bottom of Trawl Nets), by Alfonso Rojo Lucio, Boletín del Instituto Español de Oceanografía, no. 104, April 1961, 22 pp., illus., printed in Spanish. Instituto Español de Oceanografía, Alcala, 27, Madrid, Spain.

"Ob Usloviakh Obespechivaiushchikh Ustoichivoe Dvizhenie Pelagicheskogo Trala v Tolshe Vody" (On Conditions Providing Stable Motion of Pelagic Trawl in Midwater), by I. R. Matrosov, article, Rybnoe Khoziaistvo, vol. 36, no. 3, 1960, pp. 30-44, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta pri Gosplanie SSSR, Moscow, U.S.S.R.

"Een Verbeterd Hangerblok" (An Improved Trawl Block), by J. Reuter and P. Ouweland, article, Visserij-Nieuws, vol. 10, no. 7, 1960, pp. 102-105, illus., printed in Dutch. Directie der Vissereyen, 1 van den Boschstraat 4, The Hague, Netherlands.

TUNA:

An Observation on the Development of Tuna-like Fishes Trolling by Motorized Vessels (Indonesia), by M. Unar, Occasional Paper 61/76, 6 pp., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1961.

UNDERWATER PHOTOGRAPHY:

Photography of the Ocean Floor, by A. S. Laughton, Publication 4441, 17 pp., illus., printed. (Reprinted from The Smithsonian Report for 1960, pp. 319-326;

also reprinted from Endeavour, vol. 18, no. 72, October 1959.) Smithsonian Institution, Washington 25, D. C., 1961.

VENEZUELA:

El Mercadeo del Pescado Fresco de Mar con Referencia Especial al Abastecimiento en Caracas (The Market for Fresh Sea Fish with Special Reference to the Supply in Caracas), by John B. Schneider and Alejandro de Leon, 136 pp., illus., printed in Spanish. Division de Economía Agrícola, Ministerio de Agricultura y Cria, Caracas, Venezuela.

WHALING:

"Catch Material in the Season 1961/62," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 1, January 1962, pp. 16-27, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. Presents details on number of factoryships, catcher boats, gross tonnage of the vessels, and other information on the fleets engaged in 1961/62 whaling operations.

"22 Fleets Hunt Antarctic Whales," article, Fisheries Newsletter, vol. 21, no. 1, January 1962, p. 18, printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia.

WHITE PERCH:

"Movements, Reproduction, and Mortality of the White Perch, Roccus americanus, in the Patuxent Estuary, Maryland," by Romeo J. Mansueti, article, Chesapeake Science, vol. 2, nos. 3-4, September-December 1961, pp. 142-205, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

WORLD TRADE:

The following World Trade Information Service Reports, published by the Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Investment Law of the Ivory Coast, Economic Report No. 61-72, WTIS Part 1, 12 pp., 15 cents, November 1961.

Licensing and Exchange Controls--Turkey, Operations Report No. 61-73, WTIS Part 2, 4 pp., 10 cents, November 1961.

Import Tariff System of Trinidad and Tobago, Operations Report No. 61-78, WTIS Part 2, 2 pp., 10 cents, November 1961.

Import Tariff System of Indonesia, Operations Report No. 61-81, WTIS Part 2, 2 pp., 10 cents, November 1961.

Import Tariff System of Jamaica, Operations Report No. 61-83, WTIS Part 2, 2 pp., 10 cents, November 1961.

Import Tariff System of Ecuador, Operations Report No. 61-84, WTIS Part 2, 2 pp., 10 cents, November 1961.

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Licensing and Exchange Controls--Belgium-Luxembourg, Operations Report No. 61-89, WTIS Part 2, 4 pp., 10 cents, November 1961.

Food Regulations of Chile, Operations Report No. 61-90, WTIS Part 2, 4 pp., 10 cents, November 1961.

Marking and Labeling Requirements of Canada, Operations Report No. 61-91, WTIS Part 2, 16 pp., 10 cents, November 1961.

Marking and Labeling Requirements of Austria, Operations Report No. 61-92, WTIS Part 2, 8 pp., 10 cents, December 1961.



DISCOVERY OF FISH REMAINS MAY SUPPORT 50-YEAR-OLD ANTARCTIC ICE SHELF THEORY

McMurdo Sound, Antarctica--Partially decomposed remains of fish and invertebrates that may prove to be many hundreds of years old have been discovered on the surface of the frozen ice shelf near here, the National Science Foundation reported on December 7, 1960.

Well over 50 of the remains were found scattered through a small area about a mile and a half from the front of the Ross Ice Shelf near the easternmost end of the Dailey Island group by a research party from the University of Michigan.

The presence of these fish and invertebrates in that particular area suggests the occurrence of large fish in the sea beneath the ice and provides evidence for a long-standing hypothesis regarding the formation of the ice shelf itself.

The largest intact fish measured 65 inches in length, whereas some detached heads appeared to have come from still larger fish. The fish were thus the largest yet found in the waters of McMurdo Sound and the Ross Sea, and indicate that a well-developed fauna exists under the permanent ice shelf.

How the fish and invertebrates got to the surface of the ice that far from open water recalls a hypothesis put forth by Frank Debenham, a geologist with Captain Robert Scott's British (Terra Nova) Antarctic expedition of 1910 to 1913. Debenham reported finding the headless remains of a somewhat smaller fish and some perfectly preserved sponges and corals in the small general area of the ice shelf. He suggested that they might have been trapped in the ice by freezing when the bottom of the ice shelf touched the seafloor, and that they were slowly brought to the top by the progressive melting of the upper surface while new ice formed on the bottom surface.

On the basis of the evidence available to him, Debenham concluded that the ice shelf was nourished by the freezing of sea water on its bottom surface and that the main body of the Ross Ice Shelf (196,000 square miles, or about the size of Spain) might be nourished in a similar manner.

While Dr. Swithinkbank, a glaciologist who has spent many seasons in the Antarctic, believes the main body of the Ross Ice Shelf is nourished principally by the accumulation of snow on its upper surface, he agrees that the discovery of these fish apparently preserved for some hundreds of years in the ice, may support Debenham's hypothesis with respect to the McMurdo Ice Shelf--that it shows definite evidence of surface melting.

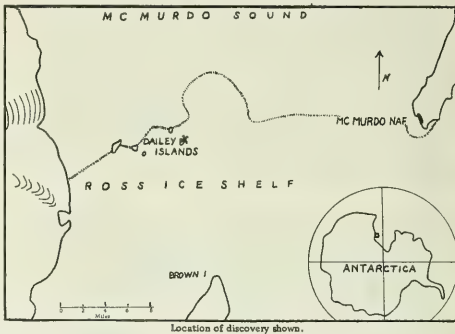
This method of nourishment of a permanent floating ice sheet of considerable area and thickness, he believes would be unique, the only known parallel being the small ice shelf off the north coast of Ellesmere Island in the Arctic.

The ice where the fish were found is probably more than 100 feet thick and the surface is at least 10 to 15 feet above sea level. Because the fish, and especially the relatively immobile invertebrate species, could scarcely have reached the surface alive--the only possible access to the sea being the intermittent tidal cracks in the ice bordering the nearby island--the finding would lend credence to Debenham's hypothesis.

Numerous deep-water invertebrates including pelecypods (bivalves or clams), gastropods (univalves or snails), brachiopods (lamp shells), siliceous sponges, and anthozoan corals were also encountered at or near the ice surface. Some of them were extremely fragile and, in the case of several of the glass sponges, were still attached to rocks that came with them from the sea floor.

In order to identify exactly the species of the discovered fish and to determine their approximate age, an Associate Professor of Biology at Stanford University, at McMurdo under a National Science Foundation grant, made a helicopter flight to the site of the discovery and collected several specimens. He said the fish appear to be members of at least two genera of nototheniidae, the most common group of Antarctic fishes. He is sending preserved specimens back to the United States for identification, and bone samples to New Zealand for carbon-14 dating.

Should the fish prove to be very old, Debenham's hypothesis will have received strong support. On the other hand, if the fish are found to have died only recently, some other explanation must be found for their presence on the ice surface so far from the open sea. Depending on what the true ice thickness is near the Dailey Islands and the rate of surface melting, Swithinkbank speculates that it might have taken anywhere from 100 to 2,000 years for the fish to reach the surface. How long the fish have been on the surface is difficult to determine. In some cases even the fish meat was especially well preserved.



FIRST OCEANGOING HYDROFOIL SHIP

The first oceangoing hydrofoil ship will be named the HS (Hydrofoil Ship) Denison, in honor of the man who initiated the project, the Chairman of the Federal Maritime Board and Maritime Administrator, U. S. Department of Commerce, announced on March 15, 1961.

Charles R. Denison was appointed in August 1957 as the first Coordinator of Research for the Federal Maritime Board and Maritime Administration. He served as advisor and consultant in the planning, execution, and guidance of the maritime research and development program which has been undertaken by the Board and Administration for the improvement of the U. S. Merchant Marine.



Artist's conception of the 80-ton, 60-knot oceangoing hydrofoil craft now nearing completion for the Maritime Administration.

One of the projects sponsored by Denison was an experimental oceangoing hydrofoil craft. He felt that the previously successful use of hydrofoils in sheltered water services might point the way to development of a ship which by lessening the drag of friction of water on the hull would permit far greater speeds than have been economically feasible for conventional ships.

After feasibility and design studies in hydrofoils by Dynamic Developments, Inc., an affiliate of Grumman Aircraft Engineering Corp., the Maritime Administration awarded this company a contract to design and construct an 80-ton, 60-knot oceangoing hydrofoil craft. The Government is paying about \$1.5 million of the estimated \$5 million value of the ship, with part of the production costs being borne by associated firms. The ship is designed to determine the practicality of large hydrofoils in the 500-1,000 ton range for high-speed ocean transportation. The ship was expected to be launched in mid-summer of 1961, and is to be delivered almost immediately after launching.

Note: See Commercial Fisheries Review, Aug. 1961 pp. 42-43.





